

EPSON®

User's Guide



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The Energy Star emblem does not represent EPA endorsement of any product or service.

Important Safety Instructions

Read all of these instructions and save them for later reference. Follow all warnings and instructions marked on the computer.

- **Unplug the computer before cleaning. Clean with a damp cloth only. Do not spill liquid on the computer.**
- **Do not place the computer on an unstable surface or near a radiator or heat register.**
- **Do not block or cover the openings in the computer's cabinet. Do not insert objects through the slots.**
- **Use only the type of power source indicated on the computer's label.**
- **Connect all equipment to properly grounded power outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.**
- **Do not let the computer's power cord become damaged or frayed.**
- **If you use an extension cord with the computer, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total of all devices plugged into the wall outlet does not exceed 15 amperes.**
- **Except as specifically explained in this User's Guide, do not attempt to service the computer yourself.**
- **Unplug the computer and refer servicing to qualified service personnel under the following conditions:**

If the power cord or plug is damaged; if liquid has entered the computer; if the computer has been dropped or the cabinet damaged; if the computer does not operate normally or exhibits a distinct change in performance. Adjust only those controls that are covered by the operating instructions.

- **If you plan to use the computer in Germany, observe the following:**

To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

Beim Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

Importantes instructions de sécurité

Lire attentivement les instructions suivantes et les conserver pour les consulter en cas de besoin. Observer soigneusement tous les avertissements et directives marqués sur l'ordinateur.

- Débrancher l'ordinateur avant de le nettoyer. N'utiliser qu'un chiffon humide. Veiller à ne pas renverser de liquides sur l'appareil.
- Ne pas placer l'ordinateur sur une surface instable ni près d'une source de chaleur.
- Ne pas bloquer ni couvrir les orifices d'aération de l'appareil. Ne pas introduire d'objets dans les ouvertures.
- Utiliser seulement le type de source d'alimentation électrique indiqué sur l'étiquette.
- Tout l'équipement doit être branché sur des prises de courant avec contact de terre. Ne jamais utiliser une prise sur le même circuit qu'un appareil à photocopies ou un système de contrôle de ventilation avec commutation marche-arrêt automatique.
- S'assurer que le cordon d'alimentation de l'ordinateur n'est pas abîmé ni effiloché.
- Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, s'assurer que l'intensité en ampères requise pour tous les appareils branchés sur ce cordon ne soit pas supérieure à la capacité du cordon. S'assurer aussi que cette intensité ne dépasse jamais la somme de 15 ampères pour l'ensemble des appareils.
- Sauf dans les cas spécifiques expliqués dans ce manuel de l'utilisateur, ne pas essayer d'entretenir ou de réparer l'ordinateur soi-même.
- Débrancher l'ordinateur et contacter un technicien qualifié dans les circonstances suivantes:

Si le cordon ou la prise sont abîmés; si un liquide a pénétré à l'intérieur de l'appareil; si on a laissé tomber l'appareil ou si le boîtier est endommagé; si l'ordinateur ne fonctionne pas normalement ou fonctionne d'une manière très différente de l'ordinaire. N'ajuster que les commandes décrites dans les directives.
- Pour utiliser l'ordinateur en Allemagne, il est nécessaire que le bâtiment soit muni d'un disjoncteur de 16 ampères pour protéger l'ordinateur contre les courts-circuits et le survoltagage.

FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☐ Reorient or relocate the receiving antenna
- ☐ Increase the separation between the equipment and receiver
- ☐ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- ☐ Consult an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada

Introduction

Your new EPSON® computer is a versatile system ideally suited for use as a network server or high-powered workstation. It offers the following features:

- ☐ **Upgradable 486SX, SX2, DX, DX2, or Pentium™ OverDrive™ processor**
- ☐ **Energy Star compliant, low-power standby mode for the video and hard disk drive in standard configurations**
- ☐ **High-speed, 32-bit local bus interfaces for both SVGA video and IDE hard disk drives**
- ☐ **4MB or 8MB of internal memory, expandable to 64MB**
- ☐ **System and video BIOS shadow RAM**
- ☐ **8KB of internal processor cache, with support for 64KB, 128KB, or 256KB of external cache**
- ☐ **1MB of on board video memory, expandable to 2MB**
- ☐ **Math coprocessor built into the microprocessor on DX, DX2, and Pentium OverDrive systems**
- ☐ **Local bus video with True Color™ support, which lets your monitor display up to 16.8 million colors**
- ☐ **Built-in SVGA port with support for energy-conserving monitors**
- ☐ **Two built-in serial ports and one built-in parallel port**
- ☐ **One built-in PS/2™ compatible keyboard port and one built-in PS/2 compatible mouse port**

- ❑ Three 16-bit, ISA option/expansion slots (one full-length and two half-length) and two 32-bit VESA local bus slots (VESA slots can also be used for ISA cards)
- ❑ Space for up to four mass storage devices, three externally accessible and one internal; on-board controllers support up to two IDE hard disk drives and two diskette drives
- ❑ Password security and anti-virus features.

Your system contains local bus interfaces for the video and IDE controllers. These buses can transfer data at the full speed of your processor rather than at the standard 8.33 MHz ISA bus speed, so your system can access the hard disk drive and process video data far more quickly. The local bus video, combined with the standard 1MB of on-board video memory, provides fast video response in a range of resolutions and colors. (See Appendix A for a list of supported resolutions.)

In standard configurations, this computer complies with the United States Environmental Protection Agency's Energy Star Program, which promotes the manufacture of energyefficient printers, computers, and monitors. Your computer's "GreenPC" feature places the hard disk drive in a low-power standby mode when the mouse or keyboard has been inactive for a specified period of time.

Note

If you have an Energy Star compliant monitor, it also goes into a low-power standby mode because it isn't receiving video signals from your computer. (Screens on non-compliant monitors go blank, but do not enter a low-power standby mode.)

The VESA option slots allow you to install high-performance VESA-compliant devices such as a graphics accelerator card, SCSI adapter, or network controller.

Your computer's SETUP configuration program lets you select different time-out periods for the hard disk drive and video signals so you can ensure that the standby feature fits the way you work.

Your system may have been configured for you. If so, everything you need to get started is already in place. The settings for your hardware configuration have been adjusted to ensure optimal system performance. The hard disk drive may contain the operating system and Microsoft® Windows™. In addition, the drivers needed to take advantage of your system's local bus features and enhanced video resolutions may have been installed for you.

Optional Equipment

You can easily upgrade your computer by installing additional memory and a wide variety of options, as described below. (Installation instructions are provided in Chapters 4 and 5.)

System Memory

By adding 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 64MB.

Video Memory

You can increase the video memory in your system to 2MB, which allows you to use higher video resolutions with more colors.

Cache Memory

You can increase the cache memory to 64KB, 128KB, or 256KB by installing additional SRAM chips on your main system board. Additional cache allows your system to access frequently used data faster, improving the overall performance of the system.

Microprocessor

Your system supports the following microprocessors:

- ☐ **486SX/25 or /33**
- ☐ **486SX2/50 or /66**
- ☐ **486DX/33, /40, or /50**
- ☐ **486DX2/50 or /66**
- ☐ **Pentium OverDrive.**

Drives

Your system can hold up to four mass storage devices, including hard disk drives, diskette drives, a tape drive, a CD-ROM drive, or an optical drive. As your storage needs expand, you can install additional drives.

SVGA and IDE Drivers

Your computer comes with special SVGA and IDE drivers for the integrated local bus SVGA and IDE hard disk drive interfaces. The IDE driver lets you use the high-speed, 32-bit local bus IDE hard disk drive interface which dramatically increases the speed of your computer as it reads from and writes to your hard disk drive.

The SVGA drivers allow you to take advantage of the local bus and extended VGA features such as high resolutions and 132-column text mode when you run popular application programs.

If your system was configured for you, these drivers have already been installed. If you need to install them yourself, see Chapter 2 for instructions on installing the IDE driver. The README.TXT file on Drivers diskette 2 tells you how to install video drivers for specific applications. See Chapter 2 for more information.

How to Use This Manual

This manual contains the information you need to get the best results from your computer. You don't have to read everything in this book; see the following chapter summaries to find the sections you need.

Chapter 1 provides instructions for setting up your system and connecting peripheral devices such as the monitor and printer.

Chapter 2 describes how to run the SETUP program to define your computer's configuration. You may need to do this the first time you use your computer. If you change the configuration later, you will need to run it again. This chapter also describes how to install the IDE driver that allows you to take advantage of your hard disk drive's local bus capabilities.

Chapter 3 covers general operating procedures, such as resetting the computer, using the password, and changing the processor speed.

Chapter 4 describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as microprocessor upgrades, option cards, and memory modules.

Chapter 5 explains how to install and remove disk drives.

Chapter 6 contains troubleshooting tips.

The Appendix lists the specifications of your computer and the operating environments that have been tested on your system.

At the end of this manual you'll find a Glossary, an Index, and a list of international marketing locations.

Where to Get Help

If you purchased your computer in the United States or Canada, EPSON provides customer support and service through a network of Authorized EPSON Customer Care Centers. EPSON also provides support services through the EPSON Connection.” In the United States, dial (800) 922-8911. In Canada, dial (800) GO-EPSON.

Call the EPSON Connection for the following:

- ☐ **Technical assistance with the installation, configuration, and operation of EPSON products**
- ☐ **Assistance in locating your nearest Authorized EPSON Reseller or Service Center**
- ☐ **Customer relations**
- ☐ **EPSON technical information library fax service**
- ☐ **Product literature on current and new products.**

You can purchase accessories, manuals, or parts for EPSON products from EPSON Accessories at (800) 873-7766 (U.S. sales only). In Canada, call (800) GO-EPSON.

When you call for technical assistance, be ready to identify your system and its configuration, and provide any error messages to the support staff. See Chapter 6 for more information.

If you purchased your computer outside the United States or Canada, contact your EPSON dealer or the marketing location nearest you for customer support and service. International marketing locations are listed at the end of this manual.

If you need help with any software application program you are using, see the documentation that came with that program for technical support information.

CompuServe On-line Support

If you have a modem, the fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins for EPSON products is through the Epson America Forum on CompuServe.®

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an EPSON product. This membership entitles you to:

- ☐ **An introductory \$15 credit on CompuServe**
- ☐ **Your own user ID and password**
- ☐ **A complimentary subscription to CompuServe Magazine, CompuServe's monthly publication**

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call the following U.S. telephone number: (614) 529-1611, or your local CompuServe access number.

If you are already a CompuServe member, simply type GO EPSON at the menu prompt to reach the Epson America Forum.

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Chapter 1

Setting Up Your System

This chapter briefly describes how to set up your computer. It includes the following information:

- ☐ **Getting started**
- ☐ **Setting the voltage selector switch**
- ☐ **Connecting system components**
- ☐ **Turning the computer on and off.**

Getting Started

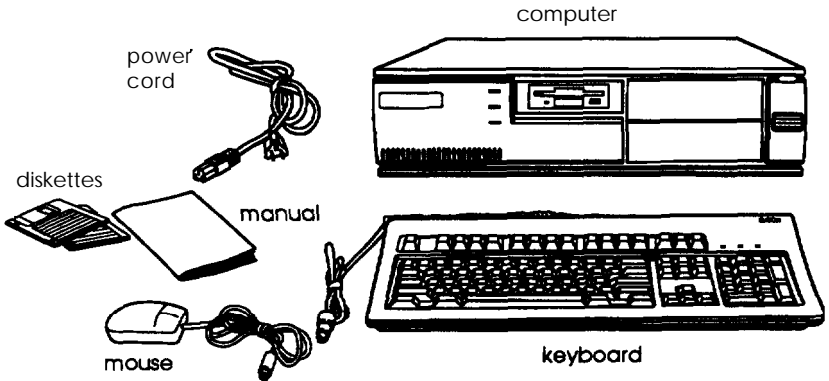
Follow the instructions below for choosing a location for your new system and unpacking it.

Choosing a Location

before you set up your system, choose a convenient location that provides a flat, hard surface. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field. Protect your computer from extremes in temperature, humidity, dust, and smoke, and avoid direct sunlight or other sources of heat.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:



If you purchased optional equipment that wasn't installed at the factory—such as option cards, memory modules, a hard disk, or a diskette drive—install these options before you connect your computer. See chapters 4 and 5 for instructions.

Setting the Voltage Selector Switch

Your system is powered by a 200 watt power supply. The power supply voltage is controlled by a switch on the computer's back panel that may be set to 110 VAC or 220 VAC.

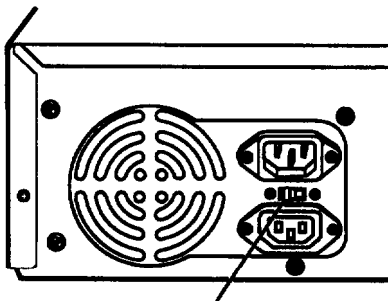
The computer is shipped with the voltage selector switch set to 110 VAC. This setting is appropriate for line source voltages between 100 and 120 VAC. This is generally the appropriate setting if you will use the computer in North America, South America, or Japan.

If you plan to operate the computer in the United Kingdom, Europe, or some South American countries, you will almost certainly need to reset the voltage selector switch to 220 VAC. Line source voltages between 200 and 240 VAC are acceptable with the switch set to 220 VAC.

Caution

before you turn on the power to your system you must be sure the voltage selector is set to the appropriate setting for the electrical power source in your location or you will seriously damage your system.

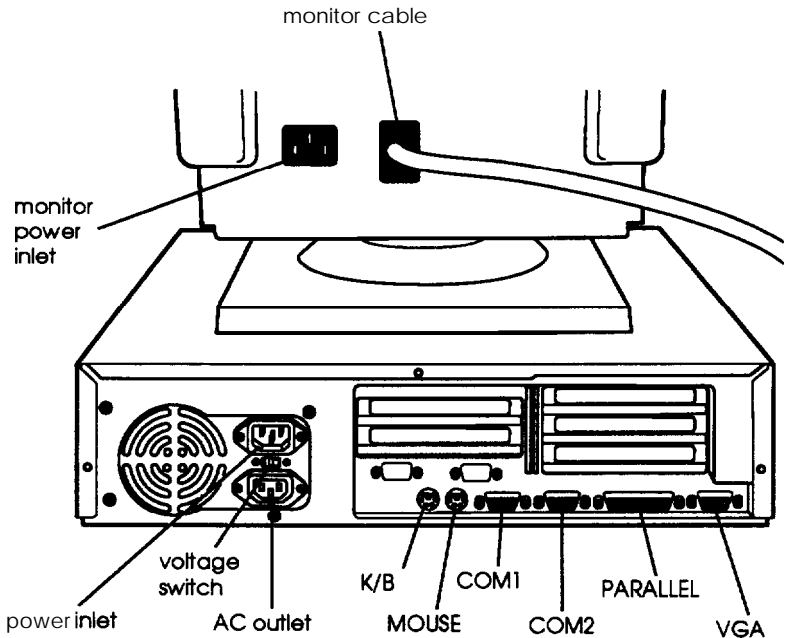
To change the voltage selector switch setting, slide the switch to the left to select 110 VAC, or to the right to select 220 VAC.



voltage selector switch

Connecting System Components

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.



Your system also includes two removable panels above the mouse and keyboard ports. You can remove these panels if you want to install a game port connector to the game port interface on the system board or if you install an optional external port.

Connecting a Keyboard or Mouse

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

If you have a PS/2 compatible mouse, connect it to the computer's built-in mouse port by inserting the connector into the port marked MOUSE.

Caution

Although the connectors and ports for the mouse and keyboard are physically identical, they cannot be used interchangeably. Be sure to plug the mouse connector into the MOUSE port, or you may damage your system.

If your system has not already been configured, you may need to install a mouse driver. See your mouse manual for instructions. (If you are using Windows, the Windows installation program automatically loads a mouse driver for Windows applications.)

Connecting a Monitor

You can connect your VGA or SVGA monitor to the computer built-in VGA port as described below.

1. Place your monitor near the computer. Turn the monitor and computer around so the backs are facing you.
2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.

3. **Examine the connector on the monitor cable and line it up with the VGA port on the computer. Then insert the connector into the port.**

Caution

To avoid damaging the connector, be careful not to bend the pins when you insert it.

4. **If the connector has retaining screws, tighten them.**
5. **Plug the monitor's power cord into the power inlet on the back of the monitor.**
6. **Plug the other end of the power cord into a grounded electrical outlet or into the power outlet on the back of the computer.**

Caution

before you plug the monitor's power cord into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp.

Connecting a Printer or Other Device

Your computer has one bidirectional parallel and two serial ports. To connect a printer or other peripheral device, follow the appropriate instructions below.

Using the parallel port

Follow these steps to connect a parallel printer to your computer:

- 1. Place the printer next to the computer so that the backs are facing you.**
- 2. Align the connector end of the printer cable with the PARALLEL port and plug it in. If the connector has retaining screws, tighten them.**
- 3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.**
- 4. Plug the printer's power cord into a grounded electrical outlet.**

Using the serial ports

If you have a printer, a modem, or other device with a serial interface, you can connect it to one of the serial (RS-232C) port. Make sure you have a cable compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the port marked COM1 and COM2. If you are connecting only one serial device, use the COM1 port.

Connecting the Power Cord

Follow these steps to connect the computer's power cord:

- 1. Plug the power cord into the power inlet on the back of the computer.**

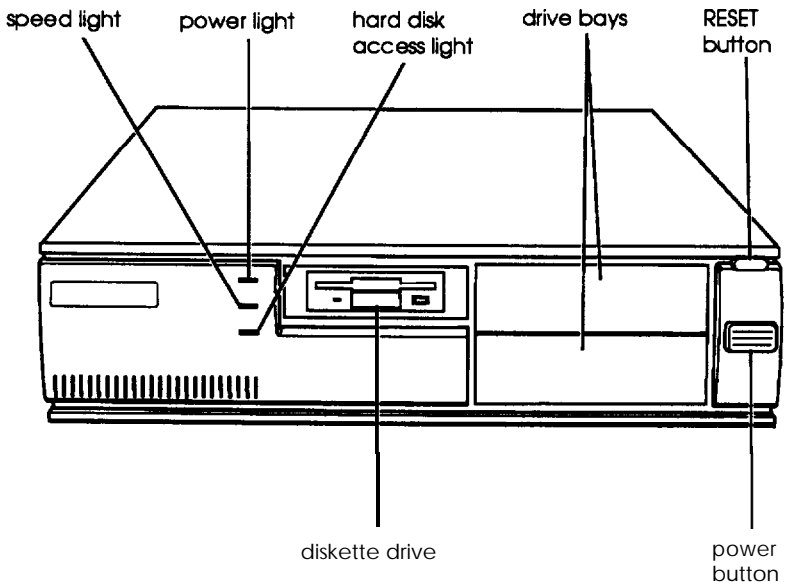
WARNING

To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

- 2. Plug the other end of the cord into an electrical outlet.**

Turning On the Computer

Once you set up your system, you're ready to turn on the power. The features on the front panel are shown below.



Before you turn on your computer, be sure to read the Important Safety Instructions at the beginning of this manual.

Follow these steps to turn on your system:

- 1. If there is a protective card in the diskette drive, remove it.**
- 2. Turn on the monitor, printer, and any other devices connected to the computer.**
- 3. If you do not have a hard disk with an operating system loaded on it, insert your main operating system diskette in drive A.**
- 4. Turn on the computer by pressing the power button on the right side of the front panel.**

The power indicator lights up, then the screen displays the BIOS version number and copyright information. The computer performs its power-on diagnostics, which are a series of checks to make sure everything is working correctly. During diagnostics, you see a message telling you to press F2 to run the SETUP program. (Chapter 2 describes starting and using SETUP.)

When the computer completes its testing, it displays a screen describing the system's configuration. If necessary, press the Pause key on the keyboard to view the configuration screen. Then press any key to continue the startup process.

- 5. If your system is configured to automatically load a program (such as Windows), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as C : \> or A: \>.**

If there is no operating system installed on your computer, you may see an error message. Ignore the message for now; once you install the operating system, you will not see this message.

Now you need to run the **SETUP** program to make sure your computer is configured properly. First turn off the computer, as described below, then see Chapter 2 for instructions. When you finish running **SETUP**, see “Post-SETUP Procedures” on page 2-16 for guidelines on what to do next.

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. **Save your data and exit any application programs.**
2. **Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Don't turn off the computer if the light is on, because you can damage the drive or lose data.**
3. **Remove any diskette(s) from the diskette drive(s).**
4. **Press the power button to turn off the computer.**
5. **Turn off the monitor, printer, and any other peripheral devices.**

Chapter 2

Running SETUP and Installing Drivers

Your computer has a configuration program, SETUP, contained within the BIOS chip on the system board. This program allows you to change the settings for your hardware configuration.

The computer also comes with several drivers and utilities on diskette, which may be already installed on your hard disk. These drivers and utilities let you take advantage of some of the advanced features of your system, like the local bus hard disk drive interface and the local bus SVGA capabilities of the built-in video interface.

This chapter describes using SETUP and installing the local bus IDE driver. If you want information about installing video drivers or utilities, see the README.TXT file included on Drivers diskette 2.

Using SETUP

You may need to run the SETUP program the first time you use your computer. If your system came unconfigured, you need to define how it is set up. If your system was configured for you, you may want to check the settings or adjust the date and time. You also may need to run SETUP again later if you change your configuration.

SETUP lets you verify or change the following:

- ☐ **System settings such as date, time, diskette drives, and type of video display**
- ☐ **Automatic or manual selection of hard disk drives**

- ☐ Automatic or manual selection of advanced hardware features for optimizing system performance
- ☐ System booting options
- ☐ Security password and anti-virus features
- ☐ Green PC options, such as the time intervals before the system and the hard disk drive go into low-power standby mode.

SETUP also provides summary information about your system.

The SETUP program and the factory default options for your computer are stored in the computer's ROM (read-only memory). The configuration information you enter is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

When you start your computer, it performs some power-on diagnostics. During these diagnostics, you may see the following message:

Press <F2> to enter SETUP

Press F2 to run SETUP. This message is only on the screen for a few seconds. If you missed it, restart your computer and try again. (If you want, you can disable this message in SETUP.)

If, during power-on diagnostics, the system detects an error in your system configuration, you hear two beeps and see an error message followed by this message:

Press <F1> to resume, <F2> to run SETUP

Press F2 to run SETUP.

SETUP displays the Main Menu. From this menu, you can select the various options to identify your system's configuration and then save your new values. If you change your mind, you can cancel any changes you have made and restore the default values stored in ROM or load the previously stored values.

The table below lists the keys you can use to perform SETUP operations.

SETUP function keys

Key	Function
↑ ↓ ← →	Move the cursor to the next or previous modifiable option
Home or End	Moves the cursor to the top or bottom of the menu
F1 or Alt H	Displays a help screen describing the option currently highlighted
F5 or -	Selects the previous value
F6 or + or Spacebar	Selects the next value
F9	Supplies the factory default values for the SETUP options on the current screen
F10	Ignores any changes you have made on the current screen
Enter	Selects the current option or value
Esc or Alt X	Returns to the previous screen or Main Menu

While you are in SETUP, the bottom of the screen lists the keys you can press to perform specific functions.

Using the System Setup Option

When you select this option, you see the System Setup screen. From this screen, you can set the system time and date, define your video display type, check system memory, and define the diskette drives.

Move the cursor to the value you want to change. Then increase or decrease the value until you see the one you want.

Setting the time and date

The real-time clock in your computer continuously tracks the date and time—even when the computer is turned off. Once you set the System Time and System Date options, you should not need to change them, unless you adjust the time for daylight savings or a different time zone. (The computer automatically changes the date for leap years.)

Setting the video display type

The Video System option allows you to define the type of display you are using. If you have connected a VGA or SVGA monitor to the computer's built-in VGA port, select EGA/VGA.

If you connected a monitor that doesn't support VGA to a video adapter card installed in your system, select either the CGA 80 x 25 or the Monochrome option. If you installed a video adapter card, make sure you disable the on-board SVGA controller by setting jumpers J20 and J21 to the Off position. (See Chapter 4 for information on jumper settings.)

Checking System Memory

When you boot your system, the system BIOS updates the memory size automatically. You see the memory configuration displayed in the System Memory and Extended Memory fields on this SETUP screen.

You cannot change these values; if they are not what you expect them to be, check your jumper settings. Also, check that the SIMM(s) are securely seated in their sockets. (See chapter 4.)

Setting the diskette drive(s)

On your system, diskette drive A is the 3.5-inch, highdensity drive installed in the computer. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

Assigning Hard Disk Drive Types

The Fixed Disk Setup option defines the types of hard disk drives you have installed in your system. When you select this option, you see the Fixed Disk Setup screen. From this screen, select *Fixed Disk 0 Control* or *Fixed Disk 1 Control*.

Your computer comes with a hard disk auto-sensing feature. Press Enter when the Autotype Fixed Disk option is highlighted. The system detects the type of hard disk drive and fills in the remaining fields on the screen.

If you are using an older drive or a preformatted drive, it may not support the auto-sensing feature. If you press Enter when the Autotype Fixed Disk option is highlighted and the drive parameters do not match your drive, check Appendix A to see if your drive's parameters are included in the hard disk drive table. If not, you need to define your own drive type or reformat the disk. See the next section for instructions on how to define your own drive type.

Defining your own drive type

If the parameters for your hard disk do not match the parameters detected by the auto-sensing feature, or if you want to use your drive with parameters other than the defaults, you can define your own drive type. (See Appendix A for a list of predefined hard disk drive types and their parameters.)

To define your own drive type, follow these steps:

1. Move the cursor to **Type** and select **User**.
2. Type the values in each field that are appropriate for your hard disk drive. Press **Tab** or **↑** and **↓** to move the cursor to the next field.
3. When you leave **SETUP**, make sure you save your changes.

Note

If you are going to install NetWare® 286, version 2.2, you must enable the system shadow option. See page 2-7.

Using the Advanced System Setup Options

When you select the **Advanced System Setup** option from the **Main Menu**, you see the **Advanced System Setup** screen. From this screen, you can select options that allow you to configure the computer's cache memory and shadow memory, and define the advanced chipset.

Note

Your system can automatically configure the **Advanced System Setup** options for you. To avoid configuration problems, you should let the system configure these options.

Configuring cache memory

The system can configure your memory Cache options or you can manually set them. If you have installed external cache, enabling cache memory improves system performance, especially in large data retrieval and processing environments.

If you choose to configure the cache memory yourself (rather than let the system configure it for you), you can define the burst wait states and two non-cacheable areas of memory. However, it's a good idea to let the system automatically configure this feature.

Configuring memory shadow

The system can configure the Memory Shadow options or you can manually enable shadowing for your system and video memory as well as for specific blocks of ROM.

Your computer can access RAM faster than ROM. The options on this screen allow your system to copy the contents of its system and/or video ROM into RAM. When you use shadowing, your system can perform certain operations faster, providing a significant increase in performance.

Note

For the best system performance, always set the System shadow and the Video shadow options to Enabled.

If you enable shadowing for specific blocks, the ROM located in this block is copied to the shadow area.

Configuring chipset registers

The system can automatically set your Advanced Chipset Control options or you can manually set them to change the values in the chipset registers and optimize your system's performance. Setting these values correctly increases your system performance; however, setting these values incorrectly may cause your system to malfunction or shut down. Be sure to set the Auto Configuration option to Enabled to let the system automatically configure these options to avoid problems.

Setting the Boot Options

When you select Boot Options from the Main Menu, you see the Boot Options screen. Options on this screen allow you to define the boot sequence and determine what information you see when you start your system.

The Disk drive boot sequence option determines the order in which the computer checks the drives for an operating system when you turn it on or reset it. The following table describes the available options.

Disk drive boot sequence options

select	To
A: then C:	Load operating system from drive A. If it isn't there, loads it from drive C (recommended setting).
C: then A:	Load operating system from drive C. If it isn't there, loads it from drive A.
c : o n l y	Load operating system from drive C.

If you set the Disk drive boot sequence option to C: only, you should disable the Floppy seek option so the system doesn't access the diskette drive during the startup procedure. Disabling this option decreases the time needed to start the system.

The other options on this screen determine what you see when your system starts.

The Display SETUP prompt during POST Option allows you to disable the message *Press <F2> to enter SETUP* that you see during power-on diagnostics. You may want to disable this prompt to prevent unauthorized users from seeing the SETUP prompt. Even when the message is disabled, however, you can still start SETUP by pressing F2 during power-on diagnostics.

The Pause on POST errors option allows you to disable the error message, followed by the message *Press <F1> to resume, <F2> to Setup* that you see when the system identifies a configuration error. If you disable this option, the system ignores configuration errors it finds during power-on diagnostics and starts as it normally would. It's a good idea to keep this option enabled.

By disabling the System summary screen at boot option, you can disable the system summary screen that you see when you start the system. If you disable this option, your system starts more quickly. You can see the same screen by selecting the System Summary option from the SETUP Main Menu. (See page 2-14).

Setting the Security and Anti-Virus Options

When you select the Security and Anti-Virus option from the Main Menu, you see the Security and Anti-Virus screen. The password options on this screen let you define both a Supervisor and a User password. You can also specify whether a password is required when you start the system.

The virus protection options on this screen allow you to write protect the boot sector on your hard disk drive and display prompts reminding you to periodically run a virus detection program and back up your hard disk drive. A Diskette Access option allows you to restrict diskette access at either the User or Supervisor password level.

Entering or changing a password

You can define both User and Supervisor password levels for this system. If this system will be used by more than one person, you may want to set a Supervisor password for yourself and a User password for others you don't want to have complete access to the system. For instance, you may want to restrict access to the diskette drives or the virus protection features on this system.

If you enable the Password on boot option, you must enter the Supervisor or User password each time you turn on the system. If you do not enable this option, but you've defined passwords, you must enter the password each time you start SETUP. If both a Supervisor password and a User password are enabled, SETUP displays options for setting the User password only to users who logged on with a User password.

To specify a User password, you must first specify a Supervisor password. Follow these steps to enter or change a Supervisor password:

1. Select the Set Supervisor Password option and press Enter.
2. You see a Set Supervisor Password window. Type the password you want to use, then press Enter. You can define a password of up to eight characters.
3. Type the same password a second time and press Enter. You see a message that your changes have been saved.
4. Press the spacebar. The Supervisor Password option now displays Enabled.

To set a User password, select the Set User Password option and follow the steps above.

Deleting passwords

To delete your passwords, follow these steps:

1. Set the Password on boot option to Disabled.
2. Delete the User password by pressing Enter for both the password field and the confirmation field. Don't type any characters in these fields.
3. Then delete the Supervisor password the same way.

Note

You must delete the User password before SETUP will allow you to access the supervisor password

If you have forgotten your password, see “Password Problems” in Chapter 6.

Using the Virus Protection Features

Several options on the Security and Anti-Virus screen allow you to define system protection features.

The **Diskette Access** option allows you to restrict access to your diskette drives based on the password levels you have defined. This prevents unauthorized users from accessing the drives and possibly introducing a virus to your system. You can restrict diskette access only if passwords are enabled and you have enabled the **Password on boot** option.

If you select **Supervisor** for this option, you can access the diskette drives only if you enter the Supervisor password when you start your system. Someone who starts the system with a **User** password, however, will see an error message when he or she tries to access the diskette drive. If you select **User** for the **Diskette Access Option**, you can access the diskette drives whether you enter the Supervisor or User password when you start the system.

Note

To use passwords for diskette drive access, you must enable the **Password on boot** option. If you select a password level or **Diskette Access**, but leave the **Password on boot** option disabled, you see an error message whenever you try to access your diskette drive.

You can also protect your system by selecting **Write to protect** for the **Fixed disk boot sector** option. When this option is enabled, the system displays an error message when a program tries to write to the boot sector of your hard disk drive. To use a legitimate program (such as the **MS-DOS FORMAT** command) you must disable the **write protect** option.

Two additional options on this screen allow you to define time intervals for the system to display a prompt asking you whether you have performed your scheduled virus check or your scheduled backup for your hard disk drive. You can disable these prompts or have them display Daily, weekly, or monthly. If you respond that you have not performed these functions, however, the system still starts normally.

Using the Green PC Features

The Green PC options allow you to define how the energy saving features of this Energy Star compliant system will work for you. The options on the Green PC Features screen allow you to disable the energy-saving feature or set time-out periods to put the system and hard disk drive in a low-energy standby mode.

The Inactivity Timer 1 option sets the time-out period for video signals to your monitor. When the mouse or keyboard has been inactive for the time period you select here, your computer stops sending video signals to your monitor. If your monitor is also Energy Star compliant, it goes into a low-power standby mode because it isn't receiving video signals from your computer. Screens on monitors that aren't Energy Star compliant will go blank when your system is in standby mode.

If you select a time period for the Lockout Timer as well as the Inactivity Timer1 option, the system won't accept your keyboard input for the specified period of time after your system has returned to an active mode. This allows time for your monitor to return to full power also.

The Fixed Disk Timeout option determines the time-out period for your hard disk drive. The hard disk drive goes into a low-power standby mode when the mouse and keyboard have been inactive for the period of time you've indicated.

Note

Some hard disk drives do not support a low-power standby mode. Also, the delay caused by the hard disk drive returning to active mode may cause errors in some applications. If you have problems, you may want to disable the Fixed Disk Timeout option.

Viewing the System Summary

When you select the system Summary option from the Main Menu, the SETUP program displays a summary of the configuration settings for your system.

This summary screen is the same one you see when you start your system. You can choose not to have the system display this screen so that system startup is faster. See page 2-9 for information on disabling this option.

Exiting SETUP

When you leave SETUP, you can save your settings, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave SETUP, press ESC from any SETUP screen. From the SETUP Main Menu, you can perform the following functions:

Load ROM Default Values	Loads the factory default settings stored in ROM back into CMOS. If you change your system configuration using the SETUP program and then have problems, you can load ROM values to boot the system and start over.
Load Values from CMOS	Loads the current values stored in CMOS for all SETUP options. This ignores any changes you have made through SETUP.
Save Values to CMOS	Saves the changes you have made to your configuration to CMOS.

Press Esc to leave SETUP and restart your computer.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer (if it is not already installed). See your operating system manual for instructions.

Once you have installed your operating system, install any software you plan to use. See your application program manuals for instructions.

Note

If you plan to install IDE or video drivers for Windows applications, you must install Windows before you can install the drivers.

Installing the IDE Driver

If you want to take advantage of the high-speed performance available through your system's local bus interface for the hard disk drive, you must install the IDE (integrated drive electronics) driver included on the Drivers diskettes.

If your system was configured for you, this driver and the SVGA drivers have been installed for you.

Before you install the IDE driver, make sure you back up your hard disk drive. Then use the installation program on the Drivers diskette 1 to install the driver.

Note

Make sure you use the installation program to install the IDE driver. If you simply copy the driver files, the driver won't work correctly.

Follow these steps to install the IDE driver:

- 1. Insert the Drivers diskette 1 in drive A.**
- 2. Log onto the IDE subdirectory on drive A.**
- 3. Type `INSTALL` and press Enter.**
- 4. Follow the instructions on the screen to install the IDE driver on your hard disk. This installation program changes your system's CONFIG.SYS file so the system loads the IDE driver as part of its startup procedure. If you select the IDE driver for Windows, this program also modifies the SYSTEM.INI file for Windows.**

You should always install the IDE driver for DOS. If you are using Windows, make sure you also install the IDE driver for Windows. Windows must be installed before you install the driver for Windows.

After you install the driver, the system reboots.

Note

Not all hard disk drives can take full advantage of the local bus IDE interface. To take advantage of this feature, your hard disk drive must support a 32-bit data path that utilizes double-word I/O. To find out whether your hard drive utilizes doubleword I/O, see the hardware specifications for the drive or contact the drive manufacturer and request a product specification.

Installing Video Drivers

Drivers diskette 2, included with your system, contains several utilities and video drivers for Windows and popular DOS applications. For instructions on installing video drivers, see the README.TXT file included on the diskette.

Place Drivers diskette 2 in your diskette drive and log onto that drive from the DOS prompt. Then, type README and press Enter to display the file.

If you want to print the file so you can follow along as you install the drivers, type READMEP and press Enter.

To obtain drivers for additional applications or new drivers which may become available, contact the EPSON Connection or access the Epson America Forum on CompuServe.

Chapter 3

Using Your Computer

This chapter briefly describes the following operations:

- ☐ Working comfortably
- ☐ Using energy wisely
- ☐ Using your Green PC features
- ☐ Inserting and removing diskettes
- ☐ Stopping a command or program
- ☐ Resetting the computer
- ☐ Using the password
- ☐ Changing the processor speed.

Working Comfortably

This section provides some tips for creating a comfortable work environment.

- ☐ Use good posture. Keep your elbows, hips, and knees bent at approximately 90 degree angles and keep your wrists as close to horizontal as possible.
- ☐ Vary your posture often and take frequent breaks. Stand up, stretch, and move around.
- ☐ Use a good chair that supports your lower back. A chair with padded armrests lets you rest your arms as you work.

- ❑ **Keep your copy stand at the same eye level as your screen. This reduces eye and neck strain. Also, rest your eyes occasionally by closing them or focusing on a fixed spot in the distance.**
- ❑ **Be gentle with your keyboard. Too much force creates tension in your hands. Also, make sure your work surface has enough room for you to move the mouse or other pointing device freely.**
- ❑ **Use good lighting that isn't too bright. Try to keep bright light sources out of your field of vision when you are looking at the screen.**
- ❑ **Place your monitor directly in front of you and sit about an arm's length away from it. The top of the screen should be slightly below your eye level so you look down at the screen. Position the monitor so that no light is reflected from the screen**

Using Energy Wisely

By purchasing this low-power, Energy Star compliant computer, you join a growing number of users concerned about conserving energy. Here are a few additional tips you can use to be even more energy-wise:

- ❑ **If your printer and monitor aren't Energy Star compliant, turn them off when you're not using them.**
- ❑ **Use the print preview option on your software before you print something. You'll be able to catch formatting errors before you commit them to paper.**

- ❑ If you have an electronic mail system available to you, send E-mail rather than memos. Not only is this faster, but you'll save paper and storage space too.
- ❑ Use recycled paper whenever you can and, if possible, reuse or recycle used paper instead of throwing it away.

Using Your Green PC Features

If you have an Energy Starcompliant monitor, your computer places the monitor, the hard disk drive, or both into a low-power standby mode when the keyboard or mouse has been inactive for the time periods you select in SETUP. See Chapter 2 for information on setting these values.

When your system is in standby mode, the NumLock light on your keyboard flashes and your screen is blank. (Screens on noncompliant monitors go blank, but do not enter low-power standby mode.) Press any key or move the mouse to resume activity.

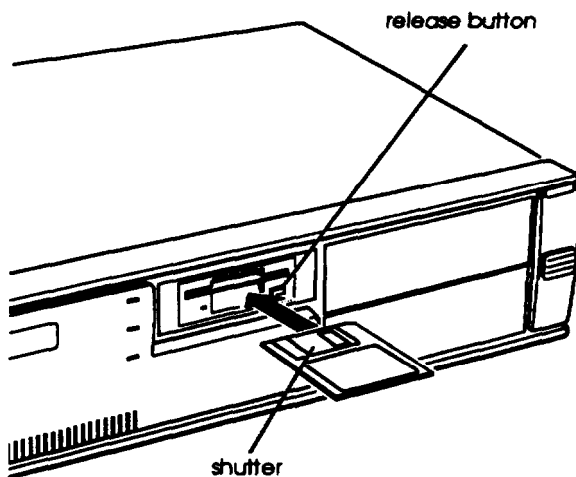
If the hard disk drive is in standby mode, it doesn't return to active mode until you access it. You'll hear it start again. It will take a few seconds to reach its operating speed and read or write to the disk. The hard disk drive access light turns on when the system begins accessing the disk.

Note

Some hard disk drives do not support a low-power standby mode. Also, the delay caused by the hard disk drive returning to active mode may cause errors in some applications. If you have problems, you may want to disable the standby mode for the hard disk drive.

Inserting and Removing Diskettes

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.



To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/write slot leading into the drive. When the disk is completely in the drive, turn down the latch to secure the diskette in the drive.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

Caution

Never remove a diskette, reset the computer, or turn it off while a diskette drive light is on. You could lose data. Also, remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command that you want to stop, try one of the following:

- ☐ **Press Pause**
- ☐ **Press Ctrl C**
- ☐ **Press Ctrl Break.**

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does not respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only if necessary.

Caution

Do not reset the computer to exit a program. Some programs classify and store new data when you exit them. If you reset the computer without properly exiting a program, you may lose data.

If you set the Disk drive boot sequence in SETUP to C: only (see Chapter 2), the operating system must be on the hard disk when you reset the computer. If you selected the other options, the operating system must be either on the hard disk or on a diskette in drive A. If you do not have a hard disk, insert the operating system diskette in drive A. If you are using DOS, you can press Ctrl Alt Del to reset the system.

You can also press the RESET button located on the front right side of your computer. The screen displays nothing for a moment and then the computer reloads the operating system.

If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If your operating system is not on the hard disk drive, insert a bootable diskette (one that contains the necessary portions of the operating system) in drive A. Then turn on the computer.

Using a Password

Using SETUP, you can define both a Supervisor level password and a User level password. You can also specify whether a password is required when you start the system. This password can also control who has access to the diskette drives.

If you enabled the Password on boot option in SETUP, you must enter the Supervisor or User password every time you turn on or reset the computer. If you enter a password but disable the Password on boot option, you must enter the password when you start SETUP.

If you set the **Diskette Access** option to **Supervisor**, you can access a diskette drive only if you entered the Supervisor password when you started your system. If you entered a User password when you started the system but the **Diskette Access** option is set to Supervisor, you see an error message when you access the diskette drive.

When you need to enter your password, you'll see the prompt, **Enter password:**. As you type your password, you see a rectangle for each character you type. When you press Enter, the computer loads the operating system (or starts SETUP).

If you don't enter the correct password the first time you type it, you can try two more times. If you haven't entered the correct password on the third try, the computer locks up to prevent unauthorized access. You see the message:

System Disabled!

You must either turn off the computer or press the RESET button to start over. In this situation, you cannot reset the computer by pressing Ctrl Alt Del.

Note

If you want to delete your password, you must run the SETUP program and follow the instructions for deleting a password in Chapter 2.

If you do not remember your password, see "Password Problems" in Chapter 6.

Changing the Processor Speed

Your computer's processor can operate at two speeds: fast (the speed of your microprocessor) or slow (8 MHZ). At fast speed, the computer performs all tasks faster. The slow speed is available for compatibility with some copy-protected programs or application programs with specific timing requirements.

Some copy-protected programs also require you to leave a key disk-the diskette that contains the copy protection-in the diskette drive. To use a copy-protected program, you can change the speed to slow to access the diskette and return it to fast speed when you are finished.

When your computer is operating at fast speed, the SPEED light on the front panel is on. When the computer is operating at slow speed, the light is off.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your key board:

- ☐ To select slow speed, press Ctrl Alt and then press the -key on the numeric keypad. This turns off the speed light.
- ☐ To select fast speed, press Ctrl Alt and then press t on the numeric keypad. The speed light comes on.

Note

You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed.

The speed setting remains in effect until you reset your computer or turn it off.

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as system, video, or cache memory modules, option cards, or a microprocessor upgrade.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

- ☐ Locating the internal components
- ☐ Changing the jumper settings
- ☐ Installing and removing SIMMs (single inline memory modules)
- ☐ Installing and removing option cards
- ☐ Adding video memory
- ☐ Installing external cache
- ☐ Installing microprocessor upgrades.

Caution

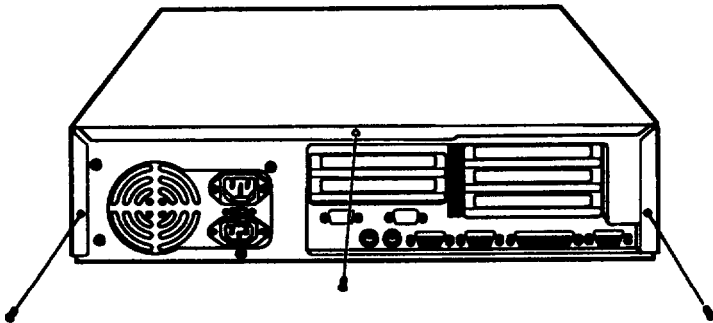
Never install options or change jumper settings when the computer is turned on or the power cable is connected to the computer.

Once you have installed your options, see "Post-installation Procedures" on page 4-27.

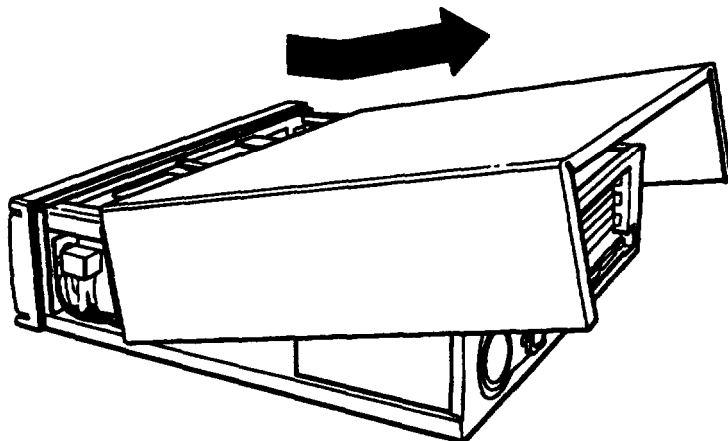
Removing the Cover

You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 5). Follow these steps:

- 1. Turn off the computer and then any peripheral devices (including the monitor and printer).**
- 2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any other cables that are connected to the computer, including the keyboard cable.**
- 3. If the monitor is on top of the computer, lift it off and set it to one side.**
- 4. Turn the computer around so the back panel is facing you.**
- 5. Remove the three screws securing the back panel, as shown below.**



6. Grasping the sides of the cover, lift it up at an angle and pull it off, as shown below:



7. Set the cover aside.
8. Ground yourself to the computer by touching the metal surface of the back panel.

WARNING

Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

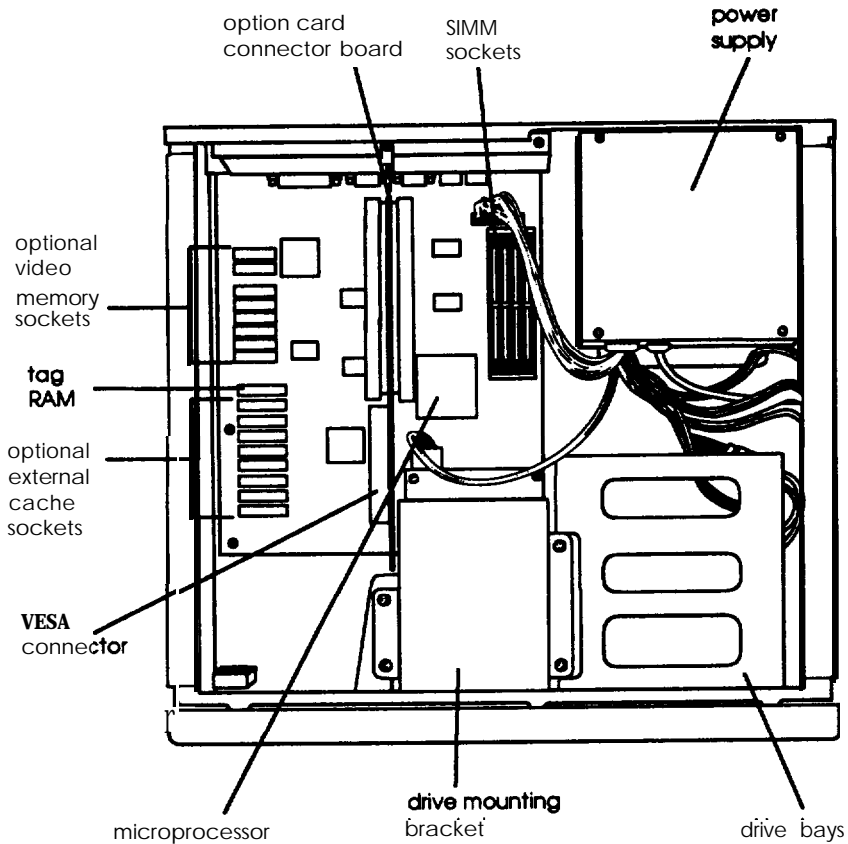
Replacing the Cover

When you are ready to replace the computer's cover, follow these steps:

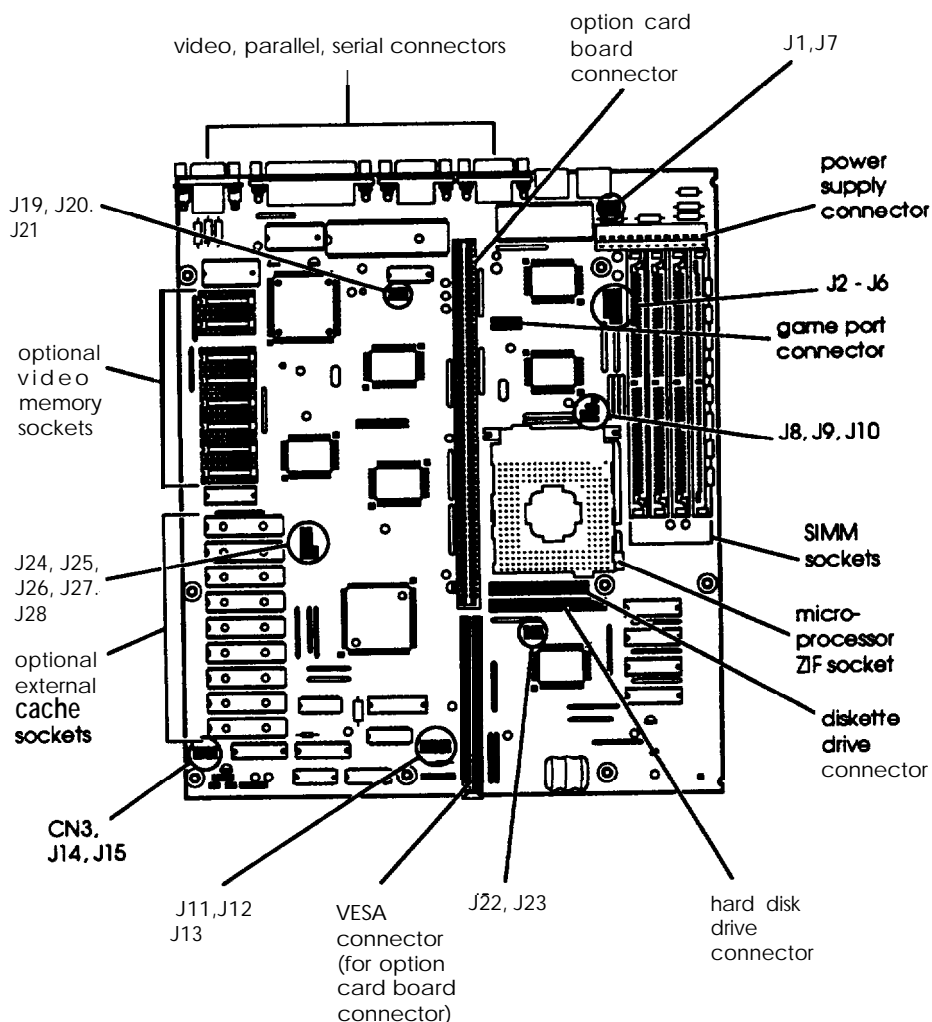
- 1. Make sure all the internal components are installed properly.**
- 2. Check all cable connections, especially those that might have been loosened during your work.**
- 3. Make sure all cables are out of the way so they do not catch on the cover.**
- 4. Insert the lip at the front of the cover between the front bezel and the computer case and guide it straight down. (See the illustration on page 4-3.)**
- 5. Replace the three cover retaining screws.**
- 6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.**

Locating the Internal Components

As you follow the instructions in this chapter, refer to the illustration below to locate the major components inside your computer.



The illustration below shows the main system board inside your computer. Use this illustration to locate jumpers, SIMM sockets, the microprocessor socket, external cache sockets, and video memory chip sockets.



Changing the Jumper Settings

The jumpers on the main system board are preset to factory default positions, indicated by an asterisk (*) in the tables below. (See the illustration above to locate jumpers.) Use the information in this section to change jumper settings, if necessary.

Note

Any jumpers not listed in the following tables are for service purposes only. Do not change their settings.

Miscellaneous jumper settings

Jumper number	Jumper setting	Function
J2	1-2* 2-3	Assigns COM2 serial port as COM2 Assigns COM2 serial port as COM4
J3	1-2* 2-3	Assigns COM1 serial port as COM1 Assigns COM1 serial port as COM3
J4	1-2* 2-3	Assigns PARALLEL port as LPT1 Assigns PARALLEL port as LPT2
J5	1-2* 2-3	Enables optional game port Disables optional game port
J6	1-2* 2-3	Enables diskette drive controller Disables diskette drive controller
J15	On* Off	Selects VESA slot running at 1 wait states Selects VESA slot running at 0 wait state
J19	Off* On	Disables IRQ9 for VGA Enables IRQ9 for VGA
J23	1-2' 2-3	Enables the IDE hard disk drive controller Disables the IDE hard disk drive controller
CN3	2-3* 3-4 1-4	Selects the system board battery Discharges CMOS memory (this resets the SETUP values to their factory defaults) Selects external battery

External cache jumper settings

Cache size	J24	J25	J26	J27	J28
64KB	On	Off	Off	1-2	Off
128KB	On	On	Off	2-3	2-3
256KB	On	On	On	1-2	1-2

Note: If you have no external cache installed, the position of these jumpers does not matter.

Processor clock jumper settings

Processor type	Clock	J11	J12	J13	J14
486SX/25, SX2/50, DX2/50	25 MHz	5-6	1-2	1-2	Off
486SX/33, SX2/66, DX/33, DX2/66, or Pentium OverDrive	33 MHz	1-2	1-2	1-2	Off
486DX/40	40 MHz	1-2, 3-4	1-2	2-3	On
486DX/50	50 MHz	3-4	1-2	2-3	On

Note: Change these jumpers only if you upgrade your CPU. Make sure you set the jumpers correctly. A setting that is too fast could severely damage your CPU.

Processor type jumper settings

Processor	J8	J9	J10
486SX/SX2	2-3	Open	Open
487SX/Pentium OverDrive	1-2,3-4	2-3	Open
486DX/DX2	1-2,3-4	1-2	Open

Note: Change these jumpers only if you upgrade your CPU.

SVGA jumper settings

VGA jumper function	J20	J21
Enable on-board VGA	On	On
Disable on-board VGA	off	off

PS/2 mouse jumper settings

Jumper function	J1	J7
Enable PS/2 mouse support	2-3	2-3
Disable PS/2 mouse support	1-2	1-2


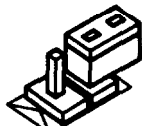
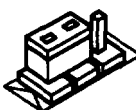
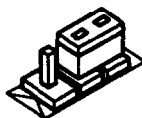
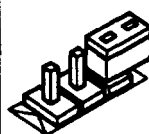
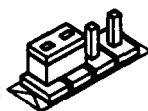
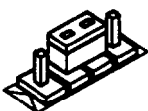
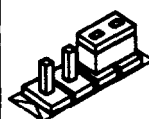
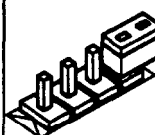
Note: Enabling PS/2 mouse support reduces your system memory by 1 K. If you need this extra memory, you can disable PS/2 mouse support and use a serial mouse.

Setting the Jumpers

To change a jumper setting, follow these steps:

- 1. Refer to the illustration on page 4-6 to locate the jumpers.**
- 2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 4-19.**
- 3. A jumper's setting is determined by where the jumper is placed on the pins. Use the following table to identify the pin settings for 2-pin, 3-pin, and 4pin jumpers. To identify pin 1, look at the system board under the jumper. A triangle is traced on the board at pin 1.**

Jumper positions

Jumper type	Position			
2-pin	On 	Off 		
3-pin	1-2 	2-3 	Off 	
4-pin	1-2 	2-3 	3-4 	
			Off 	

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

Caution

Be careful not to bend the jumper pins or damage any components on the main system board.

4. Replace any option cards you removed, if necessary.
See page 4-16 for instructions.

Installing Memory Modules (SIMMs)

Your computer comes with 4MB or 8MB of memory on a SIMM. By installing additional SIMMs, you can increase the amount of memory in your computer up to 64MB.

There are four SIMM sockets on the main system board, and each can contain one memory module. You can install 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs.

The following table shows the recommended SIMM configurations. (An x indicates that no SIMM is installed in that bank.) Do not install SIMMs in any other configuration.

SIMM configurations

BANK 0	BANK 1	BANK 2	BANK 3	Total memory
4MB	x	x	x	4MB
4MB	1MB	x	x	5MB
4MB	2MB	x	x	6MB
4MB	4MB	x	x	8MB
8MB	x	x	x	8MB
8MB	1MB	x	x	9MB
8MB	2MB	x	x	10MB
4MB	4MB	4MB	x	12MB
4MB	8MB	x	x	12MB
8MB	4MB	x	x	12MB
4MB	4MB	4MB	4MB	16MB
8MB	8MB	x	x	16MB
16MB	x	x	x	16MB
16MB	1MB	x	x	17MB
16MB	2MB	x	x	18MB

SIMM configurations (continued)

BANK 0	BANK 1	BANK 2	BANK 3	Total memory
16MB	4MB	X	X	20 MB
16MB	8MB	X	X	24MB
16MB	16MB	X	X	32MB
32MB	x	X	X	32MB
32MB	1MB	X	X	33MB
32MB	2MB	X	X	34MB
32MB	4MB	X	x	36MB
32MB	8MB	X	x	40MB
16MB	32MB	X	x	48MB
32MB	16MB	x	x	48MB
16MB	16MB	16MB	16MB	64MB
32MB	32MB	x	x	64MB

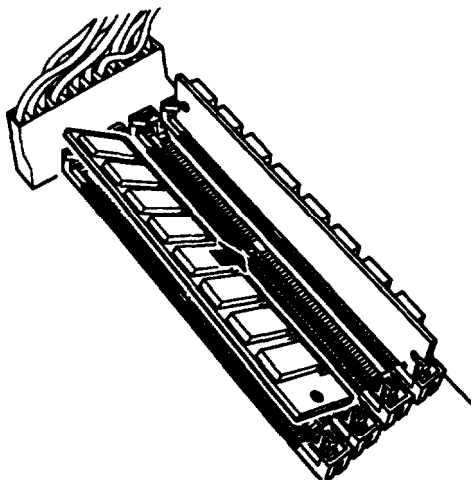
Use only tin-plated, 32-bit or 36-bit, 72-pin, fast-page mode SIMMs that operate at an access speed of 70ns or faster. Be sure all the SIMMs operate at the same speed.

Your SIMM sockets may not look exactly like the ones in the illustrations. If you're not sure how to install SIMMs, contact the EPSON Connection or ask for assistance.

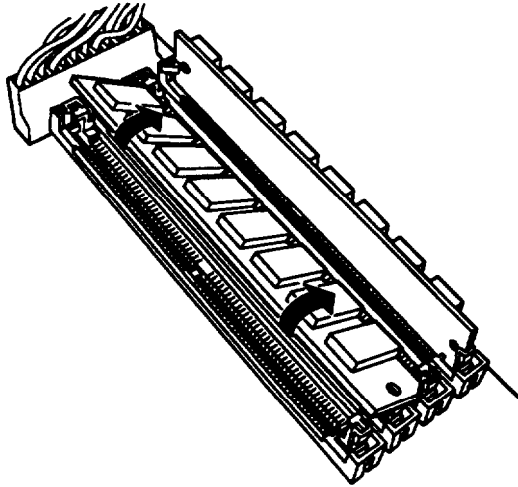
Inserting SIMMs

Make sure the computer is turned off and the cover is off. Then follow these steps to install SIMMs:

- 1. Refer to the illustration on page 4-5 to locate the SIMM sockets on the right side of the system board, next to the power supply connector.**
- 2. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-19 for instructions.)**
- 3. Turn the computer around so the back panel is facing you.**
- 4. Position the SIMM at an angle over the empty SIMM socket, as shown below, aligning the notch in the middle of the SIMM with the separator in the center of the socket.**



5. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown below, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.



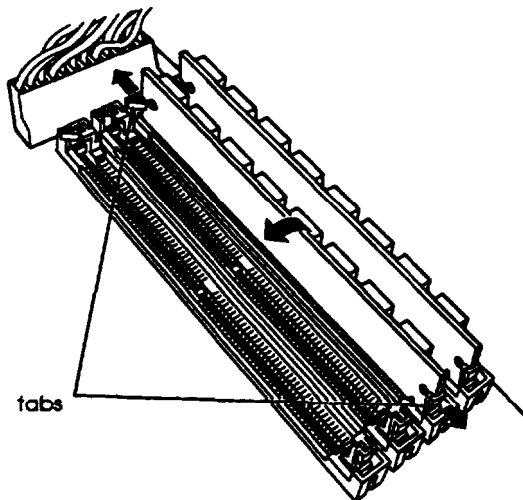
6. Replace any option cards you removed. (See page 4-16 for instructions.)

Removing SIMMs

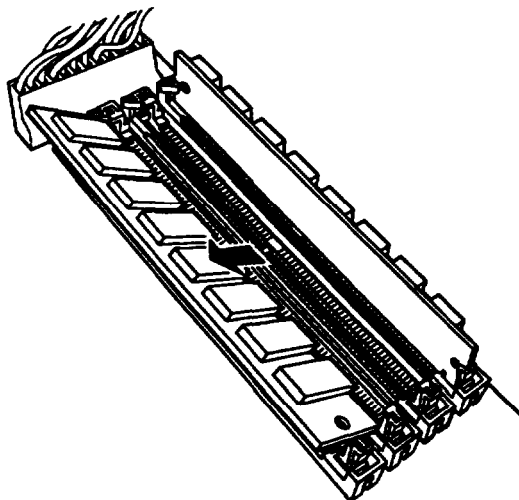
If you need to remove SIMMs from your computer (to install different ones, for example), make sure the computer is turned off and then follow the steps below:

1. Use the illustration on page 4-5 to locate the SIMM sockets on the right of the system board near the power supply connector.
2. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-19 for instructions.)

3. Use your fingers or a small screwdriver to carefully pull away the tabs that secure the SIMM at each end, as shown below. The SIMM falls to the side.



4. Remove the SIMM from the socket.



5. Follow the same procedure to remove any other SIMMs.
6. If you are inserting different SIMMs, follow the instructions on page 4-13 to install them.
7. Replace any option cards you removed, as described below.

Installing an Option Card

This section explains how to install option cards in your computer. Your computer has five 16-bit slots, three full-length and two half-length. Two of the full-length slots are VESA compatible.

Caution

Before you install any option cards in your system, make sure that no card draws current in excess of the limits listed in ~~Appendix A.~~

As you install option cards, keep these guidelines in mind:

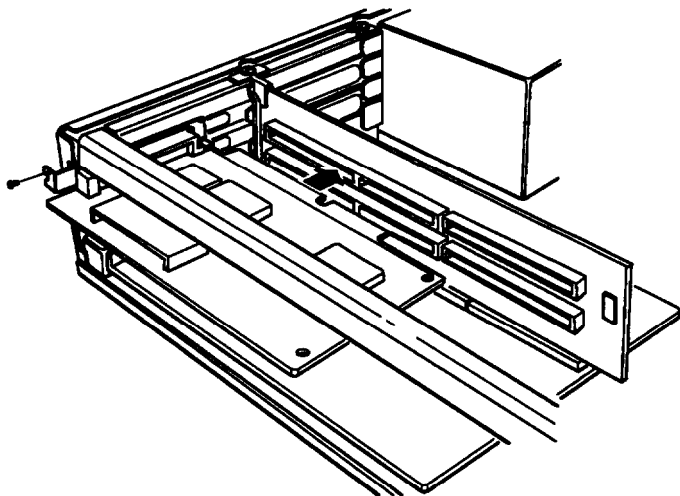
- ☐ Install VESA compatible cards in either of the two longer slots with the extra VESA connectors. If you have an 8-bit card, you can install it in a 16-bit slot, as long as it fits.
- ☐ Check the components on your card and the system board before deciding which slot to use. Make sure that no components are touching or obstructing other cards or cables.
- ☐ When you unpack the option card, do not touch the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.

- ❑ Adjust any switches or jumpers on the card, if necessary, before you install it. (See the option card instructions.) Also, see if you need to change any jumpers on the system board, such as jumper J15, which determines the wait states for your VESA slots. See page 4-7 for more information.

Installing a Card in a Full-length Slot

Refer to the illustration below and follow these steps to install an option card in one of the full-length slots:

1. Remove the retaining screw securing the option slot cover to the computer, as shown below. (Keep the screw to secure the option card to the computer.)
2. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)
3. Hold the card along the top corners and guide it into the slot, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)



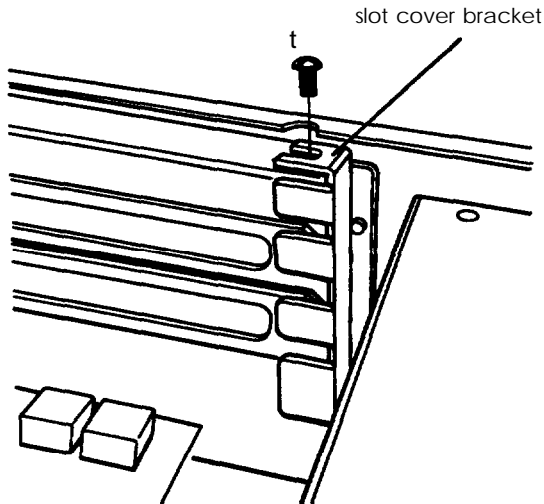
Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

4. Secure the end of the card to the computer with the retaining screw.

Installing a Card in a Half-length Slot

Follow these instructions to install a card in one of the half-length slots:

1. Remove the retaining screw securing the slot cover bracket. Remove the bracket by lifting it straight up and out of the small metal holder at the bottom.



2. Remove the slot cover.

3. **Hold the card along the top comers with the components facing down and guide it into the slot.**

Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

4. **Replace the slot cover bracket by inserting it into the small metal holder below the option slots.**
5. **Secure the slot cover bracket to the computer with the retaining screw.**

Removing an Option Card

You may need to remove an option card to access components on the main system board-to change a jumper setting for example. You may also want to remove a card if you no longer need it. Refer to the illustrations on pages 4-17 and 4-18 and follow these steps:

1. **If you are removing a card from one of the full-length slots, first remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.**
2. **If you are removing a card from one of the half-length slots, first remove the slot cover bracket. Then pull the card straight out of the slot.**
3. **Set the card aside with the component side facing up.**
4. **If you are not installing another option card, replace the option slot cover, (slot cover bracket), and retaining screw.**

Adding Video Memory

Your computer comes with 1MB of video memory. You can increase your video memory to 2MB by installing eight video DRAM, 256KB x 4 x 4, 40-pin, DIP (Dual Inline Package) chips. This is useful for *running* graphics-intensive applications or for supporting high resolutions with many colors.

You need to install eight video DRAM DIP chips to upgrade the memory. For the memory to work properly, you must install one chip in each of the empty video memory sockets on the system board.

Note that your video memory sockets may not look exactly like the ones in the illustration. If you're not sure how to install video memory chips, contact the EPSON Connection or ask for assistance.

Follow these steps to install video memory chips:

- 1. Locate the video memory chip sockets on the main system board, shown on page 4-5. The chip sockets are labeled U34 through U41.**
- 2. If there is an option card in your way, remove it. See page 4-19 for instructions.**

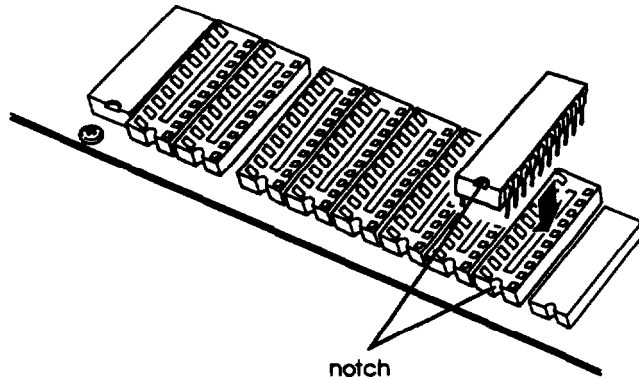
Caution

To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

- 3. Remove the memory chips from their package and inspect each one. All the pins should be straight.**

If any of the pins are bent or crooked, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the DIP chips over the first empty socket as shown below, aligning the notch on the chip with the notch on the socket.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip does not go in smoothly, remove it and try again.
6. When the chip is properly positioned, push down firmly on both ends to make sure it is well-seated.
7. Repeat steps 4 through 6 to install the remaining chips.
8. Replace any option cards you removed. See page 4-16 for instructions.
9. Now run **SETUP** as described in Chapter 2 so that your system recognizes the increased memory.

Installing External Cache

You can install 64KB, 128KB, or 256KB of external cache on your system.

- ❑ To install 64KB of external cache, use eight SRAM, 28-pin, 8x8, 20ns DIP chips, and one 8x8, 20ns tag chip**
- ❑ To install 128KB of external cache, use four SRAM, 28-pin, 32 x 8, 20ns DIP chips, and one 8 x 8, 20ns tag chip**
- ❑ To install 256KB of external cache, use eight SRAM, 28-pin, 32 x 8, 20ns DIP chips, and one 32 x 8, 20ns tag chip**
- ❑ To install any cache on a 486DX/50 system or a system with a Pentium OverDrive processor, make sure the tag chip is a 151ns chip.**

For the cache memory to work properly, you must install chips in the following configuration (each bank contains four cache memory sockets):

Cache memory configurations

BANK0 U44,45,46,47	BANK1 U48,49,50,51	Tag SRAM U43	Total cache
8 K x 8	8 K x 8	8 K x 8	64KB
32 K x 8	(empty)	8 K x 8	128KB
32 K x 8	32 K x 8	32 K x 8	256KB

Installing the External Cache Chips

Note that your external cache memory sockets may not look exactly like the ones in the illustration. If you're not sure how to install external cache chips, contact the EPSON Connection or ask for assistance.

Follow these steps to install the external cache chips:

- 1. Locate the external cache memory sockets on the main system board, shown on page 4-5.**
- 2. If there is an option card in your way, remove it. See page 4-19 for instructions.**

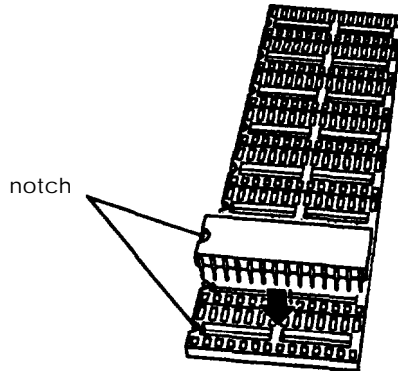
caution

To avoid generating static electricity and damaging the cache chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

- 3. Remove the cache chips from their package and inspect them. The pins should point inward at slightly less than a 90° angle.**

If any of the pins are bent or crooked, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the cache chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Align the small notch on the end of the chip with the corresponding notch on the socket.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it and try again
6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.
7. Repeat steps 4 through 6 for each of the remaining chips.
8. Change jumpers J24, J25, J26, J27, and J28, as described on page 4-8, to match to the amount of cache you installed.
9. Replace any option cards you removed (page 416); then replace the computer's cover.
10. Run **SETUP** to enable the External Cache option on the Advanced System Setup menu. (See Chapter 2).

When the computer restarts, it displays the amount of external cache you have installed.

Upgrading the Microprocessor

You can upgrade your microprocessor with a faster one to improve system performance; see the Appendix for a list of compatible microprocessors.

Note that your microprocessor socket may not look exactly like the one in the illustration. If you're not sure how to install a microprocessor, contact the EPSON Connection or ask for assistance.

Follow these steps to replace the microprocessor:

- 1. Use the illustration on page 4-5 to locate the microprocessor on the system board. The microprocessor chip may be inserted in a ZIF (Zero Insertion Force) socket.**

caution

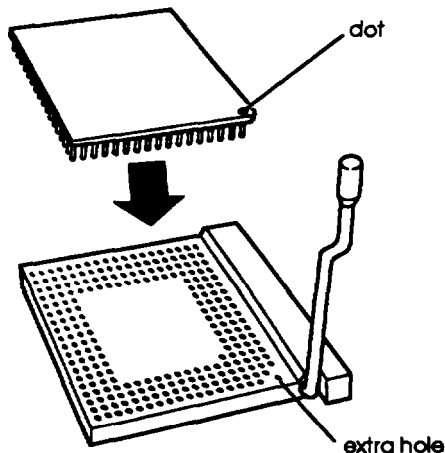
Make sure you ground yourself by touching the metal surface on the inside of the computer's back panel before you touch the processor chip. Then remain as stationary as possible while you install it. Do not touch the pins on the processor chip; handle it only by the edges.

- 2. If there are any option cards in your way, remove them. See page 4-19 for instructions.**
- 3. If necessary, disconnect the diskette drive and hard disk drive cables from the main system board to reach the socket. (see chapter 5.)**
- 4. To open the socket, locate the handle at the base of the socket. (The handle rests under a plastic tab.) Press the handle down and away from the tab; then lift it upright to release the chip from the socket. The illustration on page 4-26 shows this handle in the released position.**

Note

If your socket has a basket-type handle, lift the handle straight up to release the microprocessor.

5. Gently pull the microprocessor straight up and set it aside. (Store the chip in the packaging included with your new microprocessor, in case you need to reinstall it later.)
6. Remove the replacement chip from its package and inspect the pins. If they are bent, do not install the microprocessor chip. Contact your vendor for a new one.
7. Position the microprocessor over the socket, aligning the notched edge on the chip (marked with a dot) with the extra hole on the socket, as shown below.

**Note**

If you install the microprocessor chip in the wrong orientation, you may damage the chip and void your warranty.

8. **Make sure the pins in the processor chip are directly over the holes in the socket. Then gently push the microprocessor straight into the socket, pressing evenly on all sides.**

If you are installing a 486 chip rather than a Pentium OverDrive processor, you'll see an extra row of holes around the outside of the socket.
9. **Secure the processor chip by pressing the ZIF handle back to the closed position.**
10. **If you are upgrading from a 486SX or SX2 processor to a DX, DX2, or Pentium OverDrive processor, you need to change the jumper settings of J8, J9, and J10. If you are upgrading to a CPU with a different clock speed, you may need to change the setting of jumpers J11, J12, J13, and J14. See the tables on page 4-8 for the correct jumper settings.**
11. **If you are upgrading to a DX, DX2, or Pentium Over-Drive microprocessor, you must also install a heat sink over the microprocessor. Follow the instructions included with the heat sink.**
12. **Replace any cables you disconnected Then replace the computer's cover.**
13. **Run SETUP as described in Chapter 2 to update your computer's configuration with the new processor.**

Post-installation Procedures

After you install or remove options such as memory modules or a microprocessor, you must run SETUP to update the computer's configuration. See Chapter 2 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment.

Chapter 5

Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, a CD-ROM drive, or an optical drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to four mass storage devices. You can install one hard disk drive using the internal mounting bracket below the diskette drive. In the externally accessible bays, you can install a second diskette drive, a hard disk drive, a tape drive, a CD-ROM drive, or an optical drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 4. Then remove any option cards to access the drive bracket. Once you have installed the drive, replace any option cards you removed. See Chapter 4 for instructions.

Follow the appropriate instructions in this chapter to install and remove drives:

- ☐ **Removing the diskette drive and mounting bracket**
- ☐ **Installing a hard disk drive using the mounting bracket**
- ☐ **Removing a hard disk drive from the mounting bracket**
- ☐ **Installing a drive in an externally accessible drive bay**
- ☐ **Removing a drive from an externally accessible drive bay**
- ☐ **Post-installation procedures.**

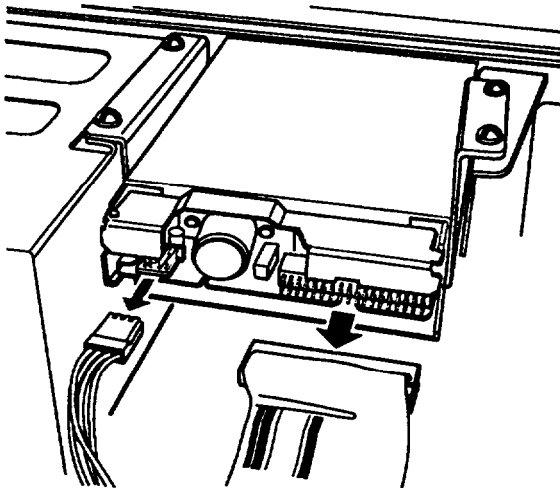
Some of the steps in this chapter may not apply for the drive you are installing. See the documentation that came with your drive for more information.

Removing the Diskette Drive and Mounting Bracket

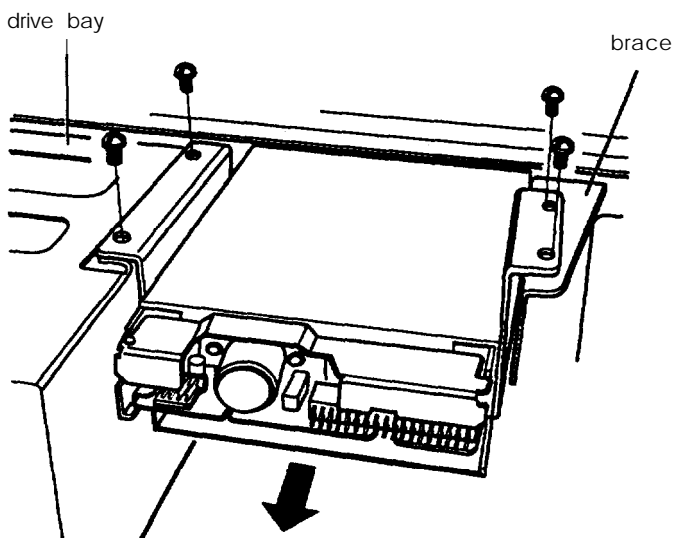
Your computer has a 3.5-inch diskette drive installed in a mounting bracket. (You may also have a hard disk drive installed in the bracket.) In order to install or remove any drives, you must first remove the drive(s) and mounting bracket.

Refer to the illustrations below and follow these steps:

1. Remove the two cables from the diskette drive. Grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. (If necessary, remove the cables from the hard disk drive also.)



2. **Remove the screws securing the bracket to the drive bay and brace.**



3. **Slide the bracket and drive(s) away from the front of the computer and lift them out.**

Installing a Hard Disk Drive Using the Mounting Bracket

You can install a hard disk drive below the diskette drive in the mounting bracket, once you have removed the bracket and drive from the computer. In order to fit in this space, your hard disk drive must be 1 inch high by 3½ inches wide. If you have a larger hard disk drive, you can install it in one of the drive bays (see page 5-15).

This section includes steps for the following procedures:

- ☐ Removing the mounting frames from the hard disk drive (if necessary)
- ☐ Installing a hard disk drive below the diskette drive in the mounting bracket
- ☐ Replacing the mounting bracket and drives in the computer
- ☐ Connecting the drive cables.

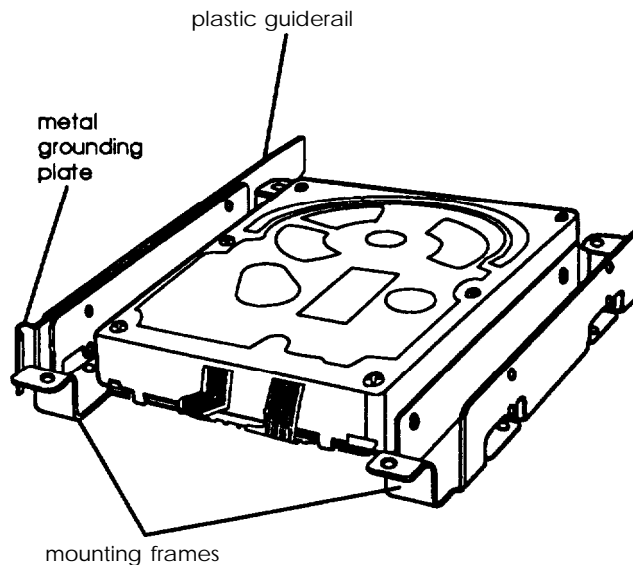
If you have two hard disk drives, one must be configured as the master (which contains your operating system), and the other as the slave. Be sure to check the jumper settings on the hard disk drive before you install it.

Also, you may need to know the number of cylinders, heads, sectors, etc., if the hard disk drive auto-sensing feature in **SETUP** is unable to correctly identify your drive. The hard disk drive table used in the **SETUP** program is included in Appendix A, along with a table of jumper settings for high-capacity EPSON drives. If your drive is not listed or you need more information, see the documentation that came with your drive or contact the manufacturer.

Removing the Mounting Frames

If there are mounting frames attached to your hard disk drive, remove them before you install the drive. Follow these steps:

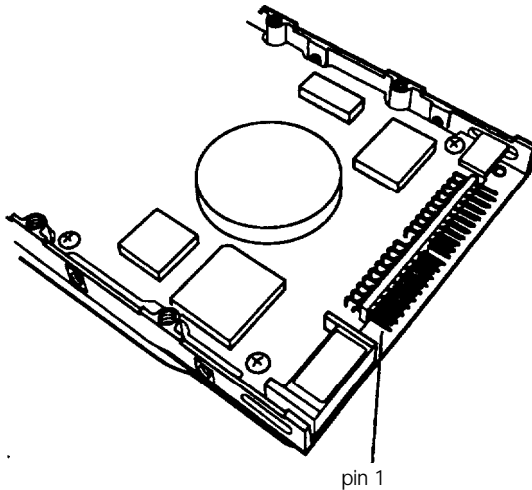
1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.



2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

Note

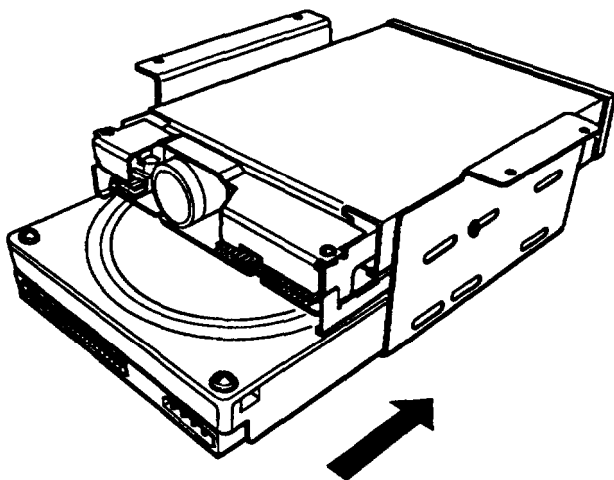
Before you install the hard disk drive, turn it over so you can see the circuit board, as shown below. Locate the side of the drive connector containing pin 1, indicated by a “1” or “2” printed on the board. You will need to know the location of pin 1 when you connect the hard drive cable.



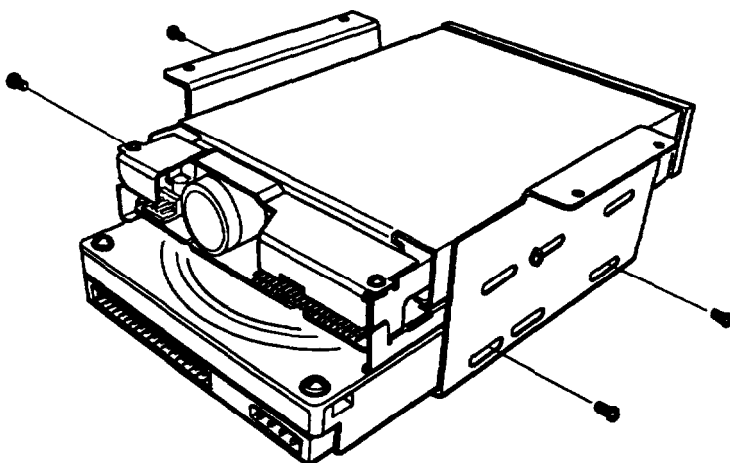
Installing the Hard Disk Drive Below the Diskette Drive

Follow these steps to install a hard disk drive in the bracket below the diskette drive:

1. With the drive components facing down, slide the drive into the bracket until the front of the drive is nearly flush with the edge of the bracket.



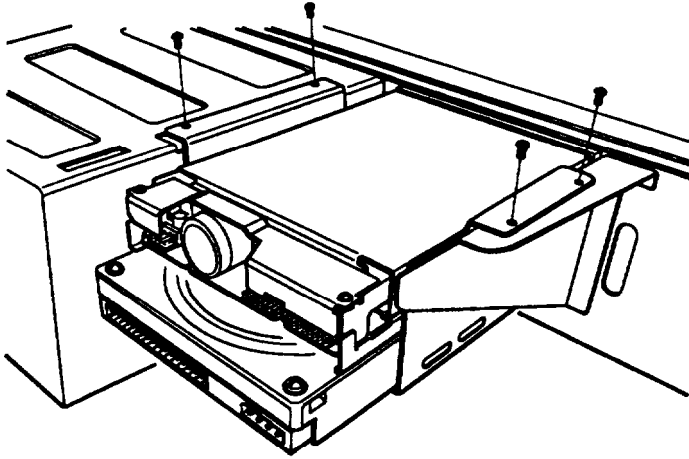
2. **Align the holes in the drive with the oval-shaped holes in the bracket.**
3. **Secure the drive with two or four screws, depending on the location of the holes.**



Replacing the Bracket and Drives in the Computer

Follow these steps to replace the bracket and drives in your computer:

- 1. Lower the bracket with the drives into the mounting area and slide it forward, inserting the front of the diskette drive through the drive slot in the front panel of the computer.**
- 2. Make sure the holes in the bracket are aligned with the holes in the drive bay and brace. Then secure the bracket with the screws you removed previously.**



Connecting the Drive Cables

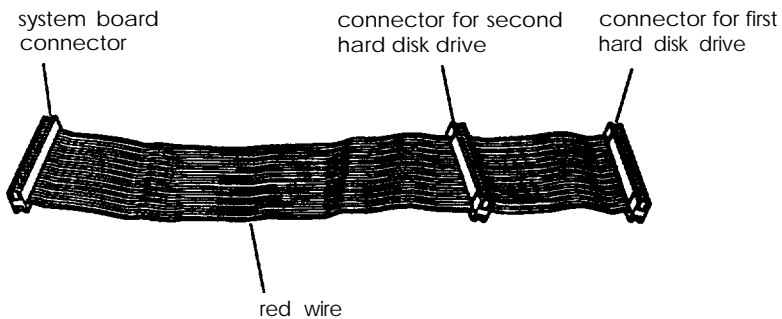
After you replace the bracket, you need to connect the cables for both the hard disk drive and the diskette drive. This section includes steps for the following procedures:

- ❑ Connecting the drive ribbon cable to the system board
- ❑ Connecting the cables to the hard disk drive(s)
- ❑ Reconnecting the cables to the diskette drive.

Connecting the drive cable to the system board

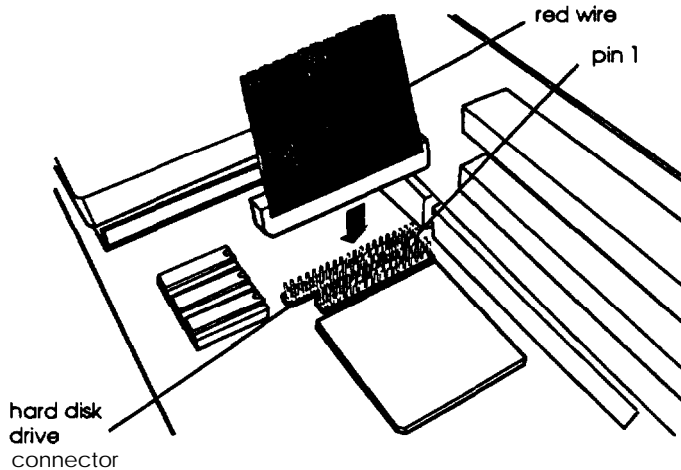
Follow the steps below to connect the hard drive ribbon cable to the system board, if it is not already connected.

1. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end and an additional connector on the ribbon cable. All the connectors on this cable look the same.



2. Locate the hard disk drive connector on the system board.

3. Position the system board connector end of the cable so that the red wire aligns with pin 1 of the connector on the system board. There is a "1" printed on the system board to identify pin 1.



4. Make sure the holes in the connector fit over the pins; then push in the cable connector.

Caution

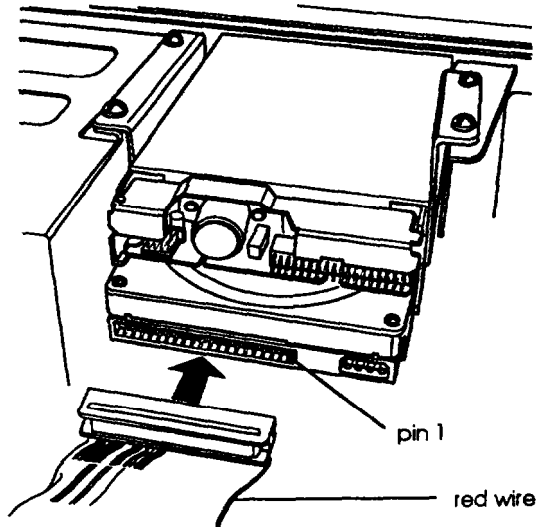
If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Connecting the ribbon and power cables to the drive

Follow these steps to connect the hard disk drive ribbon cable and a power supply cable to the drive:

1. Locate the hard disk drive connector on the end of the hard disk drive ribbon cable.

2. Locate pin 1 on the drive connector. If you do not see it on the connector casing and you did not locate it before you replaced the drive bracket, you may have to remove the drive and turn it over to check the circuit board. See page 5-14 for instructions on removing the drive and page 5-6 for instructions on locating pin 1 on the drive connector.
3. Position the connector on the cable so that the red wire aligns with pin 1 on the drive.

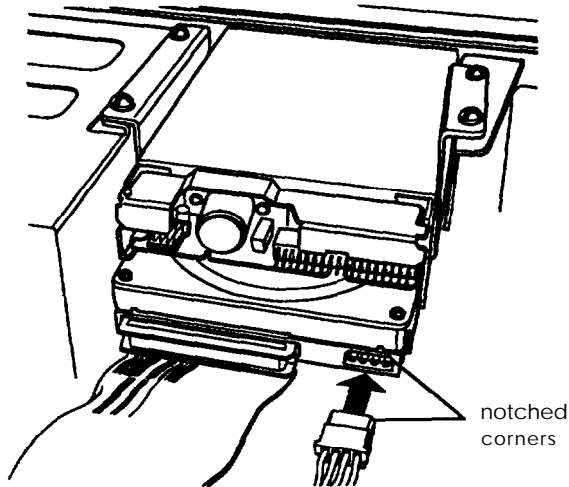


4. Make sure the holes in the cable connector fit over all the pins; then push in the connector.

Caution

If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

5. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)
6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive.



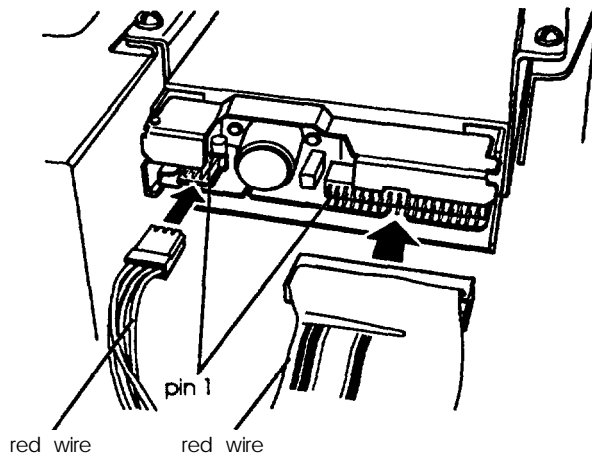
7. Make sure the holes fit over all the pins and then push in the connector.

Caution

If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Reconnecting the Cables to the Diskette Drive

After you replace the drive bracket and connect the hard drive cables, you need to reconnect the diskette drive cables.



Refer to the illustration above while you follow these steps:

1. Locate the connector on the diskette drive ribbon cable.
2. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1. Push in the connector.
3. Locate the power supply cable with the small connector.
4. Position the power supply cable connector so that the holes fit over all the pins. The red wire on the cable will align with pin 1 identified at the power connector on the circuit board of the drive. Push in the connector.

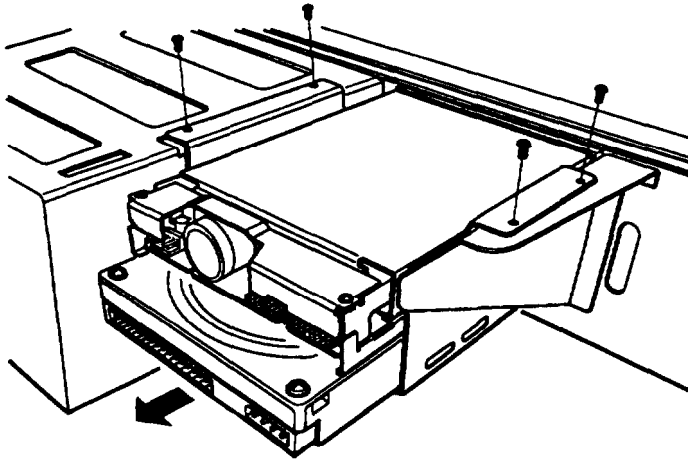
Caution

If you do not align the cable connector correctly, you could severely damage your diskette drive when you push it in.

Removing a Hard Disk Drive From the Mounting Bracket

Follow these steps if you need to remove the hard disk drive from the bracket:

1. Disconnect the cables from the back of the hard disk drive and diskette drive in the bracket. Grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables.
2. Remove the screws securing the bracket to the drive bay and brace.



3. Slide the bracket and drive away from the front of the computer and lift them out.
4. Remove the screws securing the hard disk drive to the bracket and slide the drive out of the bracket.
5. Replace the diskette drive and bracket following the instructions on page 5-8.

Installing a Drive in an External Drive Bay

Your system comes with two externally accessible drive bays. You can use these bays to install any combination of the following: a second diskette drive, hard disk drive, CD-ROM drive, tape drive, or optical drive.

If you are installing a diskette drive or a tape drive with a standard 5.25-inch diskette drive connector, you can connect it using the diskette drive cable that came with your system. If you are installing a hard disk drive or drive with a different type of connector, you may need to purchase a different cable.

If you are installing a second hard disk drive, be sure its jumper(s) are set to configure it as the slave drive; the master drive is the first one, which contains your operating system. A table of jumper settings for highcapacity EPSON drives is included in Appendix A. If your drive is not listed or you need more information, see the documentation that came with your drive or contact the manufacturer.

If you are installing a hard disk or other type of drive with a 3½-inch form factor, you will need to attach mounting frames to the drive. If you are installing a drive that already has mounting frames on it, see if it also has a plastic guiderail and metal grounding plate attached to it. If so, follow step 1 on page 5-5 to remove the guiderail and grounding plate. Then go to "Installing the Drive" on page 5-17.

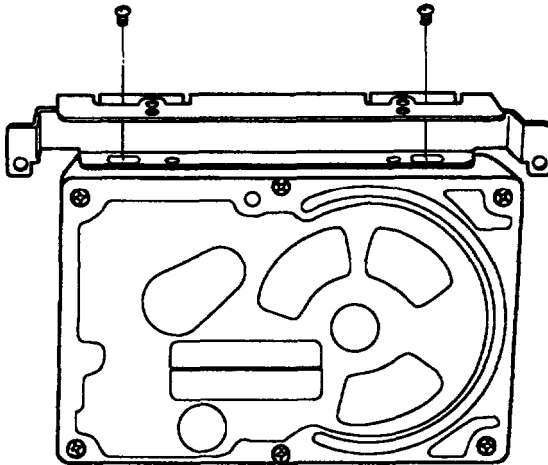
This section includes steps for the following procedures:

- ☐ Attaching mounting frames to the drive (if necessary)
- ☐ Installing the drive in the bay
- ☐ Connecting the drive cables.

Attaching Mounting Frames to the Drive

Follow these steps to attach mounting frames to a drive:

1. **Locate the two mounting frames and four screws that came with the drive.**
2. **As shown below, place a mounting frame on one side of the drive and align it so that the oval holes in the frame are positioned over the holes in the drive. Then secure the mounting frame to the drive with the two screws.**

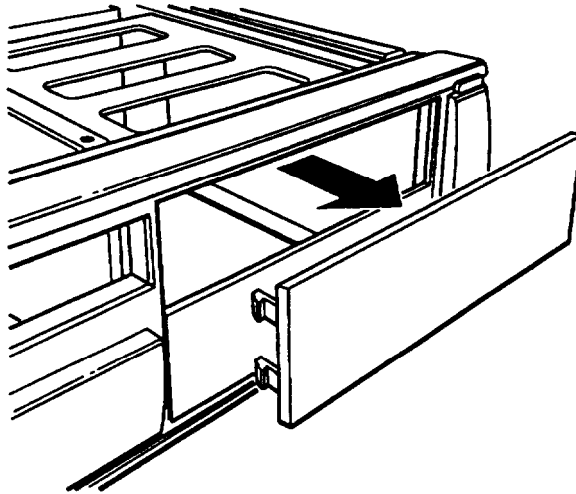


3. **Repeat step 2 to attach a mounting frame to the other side of the drive.**

Installing the Drive

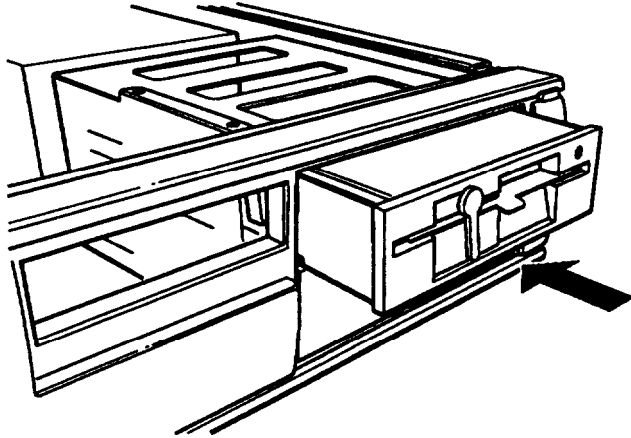
Before you can install a drive in one of the external bays, you must first remove the mounting bracket with the diskette drive (and possibly a hard disk drive). See page 5-2 for instructions. Then follow these steps to install a drive in the upper or lower drive bay:

1. Remove the faceplate from the bay by pushing it out from the inside of the computer.

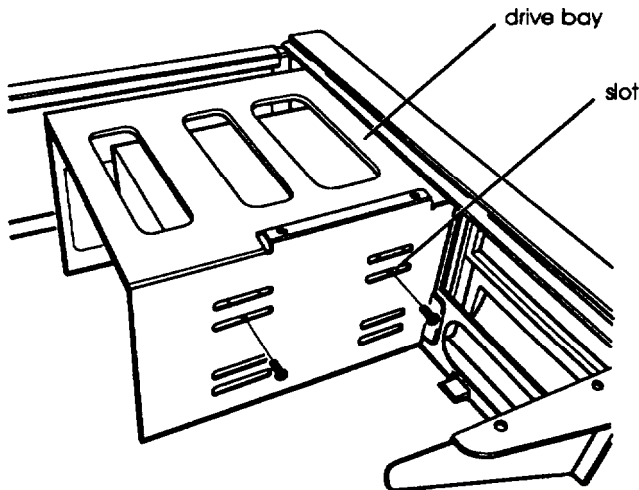


Keep the faceplate in a safe place in case you remove a drive later (or you are installing a hard disk drive).

2. Slide the drive through the slot into the bay until it is flush with the front of the computer.



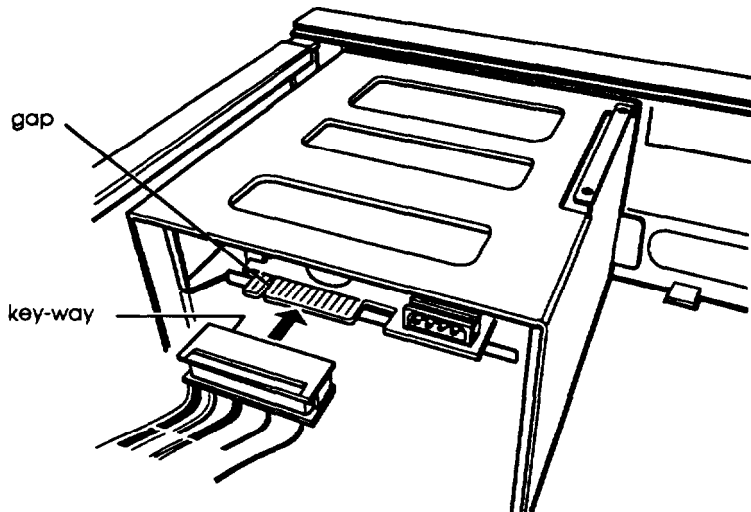
3. Align the slots at the side of the drive bay with the mounting holes in the drive or mounting frames. Then secure both sides of the drive to the bay using the retaining screws.



Connecting the Drive and Power Cables

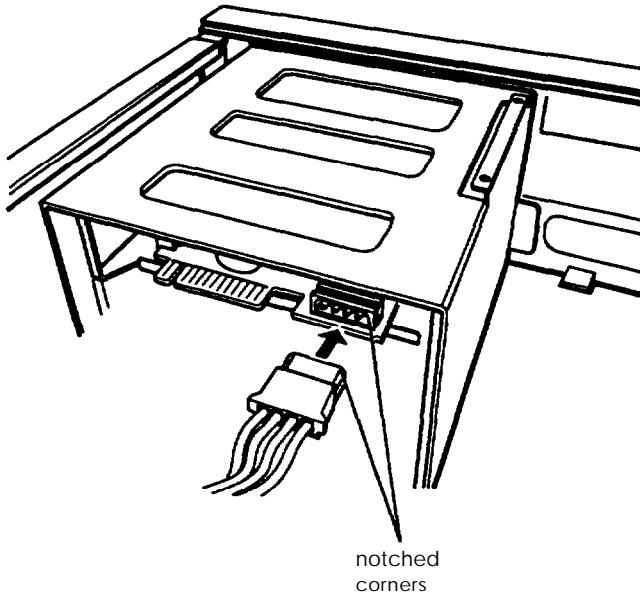
To connect the drive to the computer, you need to connect both the drive ribbon cable and a power supply cable. If you are installing a hard disk drive, follow the instructions on pages 5-9 through 5-12. Then go to step 5. If you are installing a diskette or tape drive, follow the steps below.

1. If you are installing a diskette drive, locate the diskette drive ribbon cable. (The connector in the middle of the cable is already connected to the system board.)
2. If you are installing a drive with a card-edge connector, make sure you align the key-way (the plastic divider) with the gap in the drive connector, as shown below.



If you are installing a 3.5-inch diskette drive with a header connector, see page 5-13 for instructions on connecting the cable.

3. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)
4. Align the notched corners of the power supply cable connector with the notched corners of the drive's power supply connector (such as the one shown below). Make sure the holes fit over all the pins and then push in the connector.

**Caution**

If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

5. If you installed a hard disk drive in one of the external bays, replace the faceplate. Insert one side of the plate, then gently press on the other side until it snaps into place.

If you installed a diskette drive in the bay, it is drive B; the drive installed in the mounting bracket is A. You can change the drive assignments through SETUP.

If you have one hard disk drive installed in the bracket below the diskette drive and a second hard disk drive in the bay, you will need to purchase a new hard disk drive cable that can reach both drives.

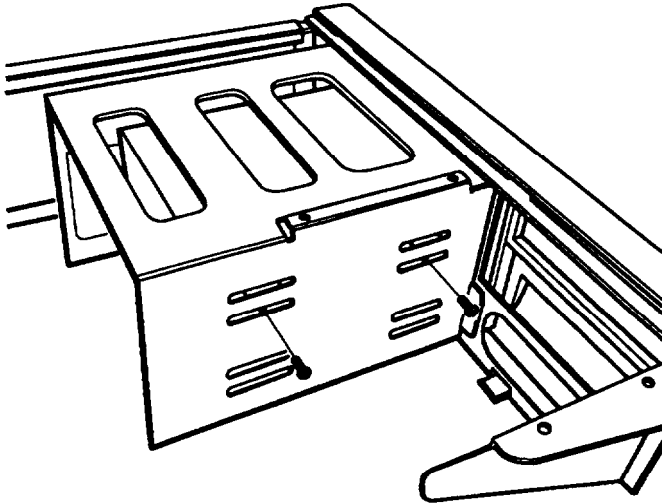
After you have completed installation of the drive in the external bay, you must replace the mounting bracket which contains the diskette drive (and possibly a hard disk drive) and reconnect the cables. See page 5-8 for instructions.

Removing a Drive from an External Bay

To remove a drive from an external drive bay, follow these steps:

1. Remove the bracket and its drives. See page 5-2 for instructions.
2. Remove both the ribbon cable connector and the power cable connector from the drive to be removed from the external bay.

3. Remove the two screws securing the drive on each side.



4. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.
5. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently pressing on the other side until it snaps into place.
6. Replace the diskette drive and mounting bracket and reconnect the cables. See page 5-8 for instructions.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover on your computer, you need to run the **SETUP** program to define the correct configuration for your newly installed drive. See Chapter 2 for instructions.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as “The computer will not start.” Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Authorized EPSON Servicer. (see “Where to Get Help” in the Introduction of this manual for instructions.)

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use these guidelines to locate information about your system:

Serial number: Look on the back panel of the computer to find the serial number.

System BIOS version: Restart your system. You'll see the system BIOS version number displayed on the screen when your system performs power-on diagnostics.

System configuration: Start **SETUP** and select the System Summary option to see your system's configuration.

MS-DOS version: At the MSDOS prompt, type **VER** and press Enter to see the MS-DOS version number.

Software versions: In Windows applications, select **About** from the Help menu. As your software application starts, it usually displays a version number on the banner screen. Also, you can check your software manual.

CONFIG.SYS: At the MS-DOS prompt, type **C:\TYPE CONFIG.SYS** and press Enter to see a listing of your CONFIG.SYS file, which contains system configuration commands.

AUTOEXEC.BAT: At the MS-DOS prompt, type **C:\TYPE AUTOEXEC.BAT** and press Enter to see a listing of your AUTOEXEC.BAT file, which contains system startup commands.

The Computer Will Not Start

the power light is on, but the computer does not start.

Make sure the boot options in SETUP are set to access drive A. Then place a bootable diskette in drive A and turn on the computer again.

Caution

If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

If your computer is set to boot from drive C, make sure that the IDE hard drive is formatted, and that the IDE controller is enabled in SETUP.

Also, your IDE driver may not be installed correctly. Start the system from a bootable diskette in drive A; then reinstall the IDE driver as described in Chapter 2. Also make sure the hard disk drive type is identified correctly in SETUP.

The computer does not start and the power light is not lit.

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

The power cord is securely connected, but the computer still does not start.

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

You installed or removed system components, and now your computer does not start.

Check to make sure you have reconnected all the internal and external cables correctly.

You may have installed a SIMM incorrectly. If the system doesn't detect memory, it won't start. Check that your SIMM(s) are securely installed in their sockets.

If you replace the microprocessor, make sure the new processor chip is installed correctly, and that the dot on the chip is aligned correctly on the system board. If you did not align the chip correctly, the system won't start. Also make sure jumpers J8, J9, and J10, as well as jumpers J11 through J13, are set correctly for your microprocessor. See Chapter 4.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a reasonable length of time, press Ctrl Alt Del. If that doesn't work, press the RESET button.

You may have installed memory using SIMMs that work at the wrong speed. Install the correct SIMMs (see Chapter 4).

Your system may have overheated. If you upgraded the microprocessor yourself, make sure you have an adequate heat sink installed on the chip.

You reset the computer, but it still does not respond.

Try turning the computer off, wait 20 seconds, and turn it on again.

Keyboard Problems

The screen displays a keyboard error message when you turn on or reset the computer.

Make sure the keyboard is securely connected to the keyboard port and not the mouse port. Although these ports look alike, they cannot be used interchangeably.

Nothing happens when you type on the keyboard.

The Lockout Timer may be set in SETUP. This option disables the keyboard for a specified period of time after the system returns to an active mode from a low-power standby mode. This delay gives Energy Star compliant monitors the time they need to return to an active mode. Wait a few seconds and try again.

See “The Computer Does Not Respond,” above.

The cursor keys on the numeric keypad do not work properly.

If the Num Lock light in the upper right corner of the keyboard is lit, press Num Lock to turn off the function.

Monitor Problems

There is no display on the screen.

Check that the monitor's power switch is on and that its power light is on.

Also, the computer may be in low-power standby mode. When you press a mouse button or a key on the keyboard, see if the monitor displays an image.

The power light is on, but you still do not see anything on the screen.

Press a mouse button or a key on the keyboard to see if the monitor or computer is in low-power standby mode. Also, check the brightness and contrast controls.

If you still do not see anything on the screen, make sure the monitor is securely connected to the computer.

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

The power switch is on but the power light is not on.

If the monitor is Energy Star compliant, it may be in low-power standby mode. Press a mouse button or a key on the keyboard to activate the monitor.

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error message.

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive.

If reinserting the diskette does not solve the problem, insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the right type, but you still see an error.

Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

The system may have the Diskette Access option in SETUP enabled. If you entered a User level password when you started the system, but this option is set to a Supervisor level, you see an error when you access the drive.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something is wrong with the data in the files.

If you are using MS-DOS, run CHKDSK ~~or SCANDISK~~ to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the correct type of diskette drive. Also check the jumper setting of J6 to make sure the diskette drive controller is enabled.

The diskette drive is making bud or unusual noises.

Contact your Authorized EPSON Servicer.

Hard Disk Drive Problems

A new/y installed hard disk drive is not working proper/y or its performance is not what you expect.

Make sure you have installed the drive correctly and check all cable corrections. Also, check the jumper settings on your drive.

Check that you have installed the IDE driver on your hard disk (see Chapter 2). To take advantage of the local bus IDE interface, your hard disk drive must support a 32-bit data path that uses double-word I/O. Also make sure your CONFIG.SYS file is loading the IDE driver when you start your system.

Some hard disk drives do not support the Energy Star features on your system. You may need to disable these features in SETUP.

You see a hard disk drive error when you start your system.

Run SETUP and check that your system is auto-sensing the correct drive type. If auto-sensing is enabled and SETUP displays information that does not match your drive, you may need to define your own drive type. See Chapter 2.

If you've loaded the IDE driver, edit your CONFIG.SYS file so that the command line for your IDE driver is after any memory or disk management utility commands. Save your changes, then restart your system.

Make sure the jumpers on the system board are set correctly. Jumper J23 enables or disables the IDE hard disk drive controller. See Chapter 4 for jumper information.

Make sure the jumpers on the hard disk drive are set correctly. See the documentation that came with the drive for more information.

You are unable to store data on the hard disk drive.

If the hard disk drive has been in low-power standby mode, make sure the drive has had time to achieve its full operating speed before you try to write data to it.

If your drive was not configured, make sure you have partitioned and formatted it correctly for your operating system. See your operating system manual for instructions.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. (All EPSON-supplied drives are physically formatted at the factory.) If it has not been physically formatted, use the format utility that came with the drive to format it before you partition it or install the operating system.

Note that a physical format is different from the action of software-based formatting commands, such as the MS-DOS FORMAT command.

You have been using your hard disk drive successfully for some time but notice a reduction in performance.

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

Check that your IDE driver is installed correctly (see Chapter 2). Make sure your CONFIG.SYS file has not been altered and that it loads the IDE driver.

If you cannot access data on your hard disk or you are seeing read/write errors, the disk may have a physical problem. Contact your Authorized EPSON Servicer.

Password Problems

You have forgotten your password.

You must discharge your CMOS memory. To do this, you need to change the setting of jumper CN3 to position 3-4. See Chapter 4 for details on changing the jumper setting.

After you have changed CN3, restart your system, leave it on for a few seconds, then turn it off again. This resets the SETUP values to their factory defaults. Both the Supervisor and the User passwords are disabled.

Set CN3 back to position 2-3. Then turn the computer on again. Use SETUP to set a new password, if you want one.

Software Problems

Windows won't start after you installed the IDE driver.

Reinstall the IDE driver, making sure you load the driver for DOS as well as for Windows.

The application program does not start.

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive. If you need help, contact your software manufacturer.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. You need to change the processor speed using a simple keyboard command. See Chapter 3 for information on changing the system speed.

The application program is having trouble reading from or writing to the hard disk drive.

If you have enabled the Fixed Disk Timeout option in SETUP, your application may be timing out during the few second delay when the hard disk drive returns to its operating speed after being in standby mode. Disable this option in SETUP.

Your application has locked the computer, making it unresponsive to keyboard commands.

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2®, UNIX®, or NetWare®, typically needs a minimum of 8MB to 16MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add more memory using the instructions in chapter 4.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly connected to the computer. Also make sure your printer has paper in it.

If you are using more than one serial port, check the primary and secondary port settings (COM1 and COM2) in your application program and in the SETUP program.

The printer prints garbled information.

Check the printer manual for the printer's correct DIP switch or control panel settings.

Also, make sure you have the proper drivers installed for your printer and make sure you've selected the correct printer within your software application.

Option Card Problems

A newly installed option card is not working correctly.

Make sure the option card is installed correctly and is well-seated in its slot. Run the SETUP program to update your computer's configuration after you install the card. Also, perform setup procedures for any software you are using with the option card.

See the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The computer may also have some jumpers that must be set for the option card to work properly. See Chapter 4 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see Chapter 3).

Make sure the option card is not touching any other card.

An external device connected to the option card is not working correctly.

Make sure you are using the proper cable to securely connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect.

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way or in the correct sockets. See Chapter 4 for information on installing SIMMS.

If you have installed a gold-plated SIMM in the sockets, the socket may have corroded slightly. Remove the SIMM and clean the gold-plated connection; then reinstall the SIMM.

Mouse Problems

Your mouse isn't working properly or you see an auxiliary device error message.

Make sure the mouse cable is securely connected to the MOUSE port and not the keyboard (K/B) port. Also make sure you installed the mouse driver correctly (if necessary). See the documentation that came with your mouse and Chapter 1 for instructions. (The Windows installation program automatically installs a mouse driver for Windows applications.)

Controller Problems

You see a controller error for the drive controllers or the i/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

If the error message refers to your diskette drive or hard disk drive controllers, make sure the jumpers for these devices are set to enabled. See Chapter 4.

External Cache Problems

The amount of cache displayed by the power-on diagnostics program is incorrect.

You may have installed the external cache chips incorrectly. They may be the wrong type, or they may not be inserted all the way. Also, make sure the tag chip you've installed is 20ns for all microprocessors except the 486DX/50 or Pentium OverDrive processor. For these processors, the tag chip must be 15ns.

Also, you may not have changed the SETUP program or the jumpers to recognize the new cache. Make sure you have set the External cache option to Enabled and set both the System shadow and the Video shadow optionsto Enabled.

See Chapter 4 for instructions on changing the jumper settings or for information on installing external cache. See Chapter 2 for instructions on using the SETUP program.

Internal Battery Problems

The screen displays an error message prompting you to run SETUP when you start your system, or your system displays an incorrect time and date.

If your system has not been used for an extended period of time, your internal NiCad backup battery may be discharged. First, run SETUP to enter the correct time and date. (You may also need to reenter your computer's configuration information.) See Chapter 2 for instructions. Then, keep your system running for several hours to recharge the NiCad battery.

Appendix

Specifications

CPU and Memory

32-bit CPU

486SX/25 or /33; SX2/50 or /66; DX/33, /40, or /50; DX2/50 or /66; or Pentium OverDrive processor

Green PC energy saver

Energy Star compliant, low-power, standby mode for the hard disk drive and video signals sent by the computer to the monitor; select time-out periods in SETUP; in a standard configuration of one hard disk drive and one diskette drive, system consumes less than 30 watts in standby mode

System speed

Fast and slow processor speeds available; fast is the speed of your processor and slow is 8 MHz; 0 wait state memory access at fast speed

Press Ctrl Alt and - to select slow speed or Ctrl Alt and + to select fast speed

ISA bus speed for all processors is 8.3 MHz; local bus video speed reflects the speed of your processor; at fast speed, SX2/50 and DX2/50 processors run internally at 50 MHz, and externally at 25 MHz; SX2/66 and DX2/66 processors run internally at 66 MHz, and externally at 33 MHz; local bus speeds for SX2 and DX2 processors are 25 (for the 2/50) and 33 (for the 2/66)

<i>Memory</i>	4MB or 8MB RAM standard on a SIMM; expandable to 64MB using 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs; SIMMs must be tin-plated, 72-pin, 32-bit or 36-bit, fast-page mode type with access speed of 70ns or faster
<i>ROM</i>	128KB Phoenix® system BIOS, video BIOS, and SETUP code located in EPROM on main system board
<i>Video RAM</i>	1MB DRAM on main system board; expandable to 2MB using eight, 4 x 4 x 256 DIP chips
<i>Shadow RAM</i>	Supports shadowing of system and video BIOS ROM into RAM
<i>Memory relocation</i>	Supports relocation of 256KB of memory from A0000h to BFFFFh and D0000h to EFFFFh to extended memory
<i>Cache</i>	8KB of internal cache; supports 64KB, 128KB, or 256KB of external cache using 28-pin, 8 x 8 or 32 x 8, 20ns DIP chips
<i>Math coprocessor</i>	Math coprocessor built into the microprocessor for DX, DX2, and Pentium OverDrive systems
<i>Clock/calendar</i>	Contained in the 82C491 system controller chip along with 64 bytes of CMOS RAM, backed up by a soldered NiCad rechargeable battery

Controllers

<i>Video</i>	Cirrus Logic® GD5428 high-speed, super VGA local bus controller with True Color support; provides resolutions up to 1280 x 1024 in 256 colors
<i>Diskette</i>	Controller on main system board supports up to two diskette drives or one diskette drive and a tape drive
<i>Hard disk</i>	Energy Star compliant, high-speed, 32-bit local bus IDE interface on main system board supports up to two IDE hard disk drives with built-in controller; BIOS provides hard disk autosensing function

Interfaces

<i>Monitor</i>	Energy Star compliant VGA interface for fixed or multi-frequency monitor built into system board; 15-pin, D-shell connector
<i>Parallel</i>	One standard, g-bit, parallel, bidirectional interface built into main system board; 25-pin, D-shell connector
<i>Serial</i>	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors
<i>Keyboard</i>	PS/2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector

Mouse PS/2 compatible mouse interface built into main system board; 6-pin mini DIN connector

Optional game port Optional 10-pin game port interface on system board; can control joy-stick functions with the addition of a port connector

Option slots Five 16-bit I/O expansion slots; ISA compatible, 8.33 MHz bus speed, three full length and two half length; of the three full-length slots, two are also VESA compatible and run at the bus speed of the CPU (up to 50 MHz)

Speaker Internal

Mass storage Internal mount:
One 3½-inch wide, one-inch high drive

Externally accessible mounts:
One 3½-inch wide, one-inch high drive and two 5¼-inch wide, half-height drives

Diskette drive types 3.5-inch diskette drive, 720KB or 1.44MB storage capacity; 5.25-inch diskette drive, 360KB or 12MB storage capacity; or combination 3.5-inch/5.25-inch diskette drive

Hard disk drive types 5¼-inch or 3½-inch form factor hard disk drive(s), up to half-height size; maximum of two drives

<i>Other devices</i>	Half-height tape drive, CD-ROM drive, optical drive, or other storage device; 5¼-inch, or 3½-inch with mounting frames
----------------------	--

Keyboard	Detachable, twoposition height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys
-----------------	---

Mouse	Detachable, twobutton, PS/2 compatible
--------------	--

SETUP Program	Stored in ROM; accessible by pressing F2 during boot
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<i>System security</i>	User and Supervisor level passwords (8 characters) available for system boot or diskette access
------------------------	---

<i>Virus protection</i>	Write protection feature for the hard disk drive boot sector; periodic reminder message for running virus detection utility
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Physical Characteristics

<i>Width</i>	16.8 inches (427 mm)
<i>Depth</i>	15.8 inches (401 mm)
<i>Height</i>	4.4 inches (112 mm)
<i>Weight</i>	17.4 lb (7.9 kg) with one diskette drive, without keyboard

Power Supply

Type	200 Watt, UL/TUV/CSA listed, fan-cooled
Input ranges	90-130 VAC or 180-260 VAC; switch-selectable
Maximum output	+5 VDC at 20 Amps, -5 VDC at 0.5 Amp +12 VDC at 8 Amps, -12 VDC at 0.5 Amp
Frequency	47 to 63 Hz
Cables	Two to main system board, five to mass storage devices

Option Slot Power limits

<i>Output voltage (VDC)</i>	+5 Volts	-5 Volts	+12 Volts	-12 Volts
For all slots	12 Amps	0.4 Amp	4.0 Amps	0.4 Amp

Environmental Requirements

Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 90° F (5° to 32° C)	-4° to 140° F (-20° to 60° C)	-4° to 140° F (-20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	-330 to 9,900 ft (-100 to 3,000 m)	-330 to 39,600 ft (-100 to 12,000 m)	-330 to 39,600 ft (-100 to 12,000 m)
Maximum wet bulb	68° F (20° C)	104° F (40° C)	134° F (57° C)

Video Resolutions and Colors

Resolution	Memory Requirements (MB)	Color	Refresh rates (Hz)	Remarks
640 × 480	1	256	60/72	8 bits/pixel
	1	32K/64K	60	16 bits/pixel
	1	16.8M (True Color)	60	24 bits/pixel
800 × 600	1	16	56/60/72	4 bit planes
	1	256	56/60/72	8 bits/pixel
	1	32K/64K	56	16 bits/pixel
1024 × 768	1	16	43.5/60/70/72	4 bit planes*
	1	256	43.5/60/70/72	8 bits/pixel*
	2	64K	43.5	16 bits/ pixel**
1280 × 1024	1	16	43.5	4 bit planes**
	2	256	43.5	8 bits/pixel**

• Non-interlaced and interlaced

** Interlaced

EPSON monitor types

EPSON monitor	Horizontal Frequency (kHz)	Maximum refresh rates (Hz)			
		640 × 480	800 × 600	1024 × 768	1280 × 1024
14" VGA mono (A880611)	31.5	60			
14" .39 pitch VGA color (A881371)	35	60	56	43.5 (87 interlaced)	
14" .28 pitch VGA color (A881381)	35	60	56	43.5 (87 interlaced)	
14" .28 pitch VGA color (A881391)	48	60 75*	72 60*	60	
15" .28 pitch VGA color (A880491)	60	72 75*	72 75*	70 75*	
17" Professional Series (A804241)	75	72 75*	72 75*	60 75*	70*
20" Professional Series II (A804341)	82	60 75*	72 75*	75	75

* These rates are calculated, but not specified in the monitor's documentation.

Hard Disk Drive Types

Hard disk drive types

Type	Size* (MB)	Cylinders	Heads	Sectors/ track	Landing zone	Write precomp	Drive name
1	85	903	4	46	903	0	CP30084E
2	121	762	8	39	762	0	CP30104H
3	106	1024	12	17	1024	0	ST3123A
4	65	940	8	17	615	300	
5	49	940	6	17	940	512	
6	170	903	8	46	903	0	CP30174E
7	171	332	16	63	332	0	CP30174
8	213	1024	12	34	1024	0	ST3243A
9	117	900	15	17	901	0	
10	341	768	14	62	768	0	ST3390A
11	528	1024	16	63	1024	0	ST3655A
12	52	855	7	17	855	0	
13	170	1010	6	55	1010	0	AC1170
14	255	1010	9	55	1010	0	AC2250
16	341	1010	12	55	1010	0	AC2340
17	212	989	12	35	989	0	AC1210
18	213	685	16	38	685	0	CFS210A
19	62	1024	7	17	1023	512	
20	31	733	5	17	732	300	
21	127	919	16	17	919	0	ELS127A
22	31	733	5	17	733	300	
23	170	1011	15	22	1011	0	ELS170A
24	245	723	13	51	723	0	LPS240A
25	252	895	10	55	895	0	CP30254
26	343	665	16	63	665	0	CP30344
27	540	1048	16	63	1048	0	CFA540A, AC2540
28	426	826	16	63	826	0	CFS420A
29	131	1002	8	32	1002	0	7131A
30	245	967	16	31	967	0	7245A
31	345	790	15	57	790	0	7345A

Hard disk drive types (continued)

Type	Size* (MB)	Cylinders	Heads	Sectors/ track	Landing zone	Write precomp	Drive name
32	42	809	6	17	809	128	
33	50	830	7	17	830	0	
34	72	830	10	17	830	0	
35	44	1024	5	17	1024	0	
36	71	1024	8	17	1024	0	
37	42	615	8	17	615	128	
38	109	1024	8	26	1024	0	
39	72	925	9	17	925	0	
40	80	1024	9	17	1023	0	
41	119	918	15	17	917	0	
42	130	1001	15	17	1001	0	ST3145A
43	143	823	10	34	822	0	
44	84	969	5	34	968	0	
45	118	969	7	34	968	0	

- * Actual formatted size may be slightly different than size on drive label; you cannot change this value.

Drive Option Information

Hard disk drive options for high-capacity, 1-inch IDE drives

Parameters	Conner®							Quantum®		Western Digital®		
	CP-30004E	CP-30104H	CP-30174E	CP-30254	CP-30344	CFS420A	CFA540A	ELS170AT	LPS240AT	AC1170	AC2250	AC2340
Formatted capacity (MB)	85	120	170	250	340	420	540	170	245	170	240	340
Size, width x height (in)	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	3.5 x 1	3.5 x 1	3.5 x 1
Weight (lbs)	1.3	1.3	1.3	1.2	1.2	1.16	1.16	0.91	1.05	1.12	1.12	1.12
Cylinders	1806	1524	1806	1895	2116	2388	2805	1536	1818	2233	2233	2233
Disks	1	2	2	2	2	2	2	2	2	1	2	2
Heads	2	4	4	4	4	4	4	4	4	2	3	4
Sectors per track	46	39	46	62	63 - 95	63 - 100	72 - 114	54	44 - 87	56 - 96	56 - 96	56 - 96
Rotational speed (RPM)	3822	3399	3833	4542	4500	3600	4500	3663	4306	3322	3322	3322
Buffer size (KB)	32	32	32	64	64	32	256	32	256	64	64	128
Average seek time (ms)	17	<19	17	14	13	14	12	17	16	<13	<13	<13
Encoding method	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7
Power dissipation (seek)	3.75 W	3.9 W	3.75 W	3.75 W	3.75 W	5-12 W	5.7 W	4.0 W	4.9 W	5.2 W	5.2 W	5.2 W
Logical parameters												
Cylinders	903	762	903	895	655	826	1048	1011	723	1010	1010	1010
Heads	4	8	8	10	16	16	16	15	13	6	9	12
Precomp zone	0	0	0	0	0	0	0	none*	none*	1011	1011	1011
Landing zone	903	762	903	895	655	1048	1048	1011	723	1011	1011	1011
Sectors	46	39	46	55	63	63	63	22	51	55	55	55

* Select 1 or none for the precomp value. If neither of these options are available, select the maximum available precomp value.

IDE hard disk drive jumper settings

Model number	Single drive	Master drive	Slave drive
Conner CP30084E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30104H	C/D jumpered	C/D, DSP jumpered	No jumpers
Conner CP30174E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30254	C/D jumpered	C/D jumpered	No jumpers
Conner CP30344	C/D jumpered	C/D jumpered	No jumpers
Conner CFA540A	C/D jumpered	C/D jumpered	No jumpers
Quantum ELS170AT	DS jumpered	DS, SP jumpered or DS jumpered	No jumpers
Quantum LPS240AT	DS jumpered*	SP and DS jumpered*	No jumpers
Western Digital AC1170	No jumpers	MA jumpered	SL jumpered
Western Digital AC2250	No jumpers	MA jumpered	SL jumpered
Western Digital AC2340	No jumpers	MA jumpered	SL jumpered

- CS (cable selection) can be jumpered for any configuration. When CS is used, the drive is a master if pin 28 is grounded, and a slave if pin 28 is not grounded.

DMA Assignments

Level	Assigned device
DMA0	Reserved (8-bit)
DMA1	Reserved (8-bit)
DMA2	FDD controller (8-bit)
DMA3	Reserved (8-bit)
DMA4	Cascade for DMA controller 1
DMA5	Reserved (16-bit)
DMA6	Reserved (16-bit)
DMA7	Reserved (16-bit)

Hardware Interrupts

IRQ no.	Function
IRQ0	Timer output 0
IRQ1	Keyboard
IRQ2	Cascade IRQ controller 2
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Parallel port 2
IRQ6	FDD controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	HDD controller
IRQ15	Reserved

System Memory Map

FFFFFFFFh	System BIOS ROM: 64KB Duplicated from 0F0000h	
FFFFF000h	Resewed for system board: 64KB Duplicated from 0E0000h	64MB (Maximum system memory)
4000000h	Extended memory	
00100000h	System BIOS ROM: 64KB Default Shadow RAM duplicated at FF0000h	1MB
000F0000h	Unused or I/O expansion ROM: 160KB Reserved for ROM on I/O adapters	
000C8000h	VGA BIOS ROM: 32KB Default shadow RAM	
000C0000h	VGA text (color): 32KB	
000B8000h	Unused or VGA text (monochrome): 32KB	
000B0000h	Video memory: 64KB Resewed for graphics display buffer	
000A0000h	Conventional system memory: 640KB	640KB
00000000h		

System I/O Address Map

Hex address	Assigned device
000-01F	DMA controller 1,8237
020-03F	Interrupt controller 1,8259
022 - 024	UMC 82C481 chip set configuration register
034, 038, 03C	AD12 chip set configuration registers
040 - 05F	Timer, 8254
060 - 06F	Keyboard controller, 8042
070 - 07F (CMOS)	Real-time clock NMI (non-maskable interrupt)
080 - 09F	DMA page register, 74LS612
0A0 - 0BF	Interrupt controller 2, 8259
0C0 - 0DF	DMA controller 2, 8237
0F0	Clear math coprocessor
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk
200 - 207	Game I/O
278 - 27F	Parallel printer port 2
280 - 2DF	Alternate enhanced graphics adapter
2E1	GP1B (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31F	Prototype card
360 - 363	PC network (low address)
368-368	PC network (high address)
378 - 37F	Parallel printer port 1
380-38F	SDLC, bisynchronous 1
390 - 393	Cluster
3A0-3AF	SDLC, bisynchronous 2
380-38F	Monochrome display and printer port
3C0-3CF	Enhanced graphics adapter
3D0-3DF	Color graphics monitor adapter
3F0-3F7	Diskette drive controller
3F8-3FF	Serial port 1

**System I/O address map (continued)*

Hex address	Assigned device
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter 2)
B90, B93	Cluster (adapter 2)
EE2, EE3	Data acquisition (adapter 3)
1390 - 1393	Cluster (adapter 3)
22E1	GP1B (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GP1B (adapter 2)
63E1	GP1B (adapter 3)
82E1	GP1B (adapter 4)
A2E1	GP1B (adapter 5)
C2E1	GP1B (adapter 6)
E2E1	GP1B (adapter 7)

System Board Components

Socket	Component
U1, U2, U4, U6	SIMM sockets
U5	Keyboard/mouse controller
U12, U13	Super I/O controller (UMC82C863, 865); supports up to two diskette drives, two serial ports, and one parallel port
U15	Microprocessor (ZIF socket)
U17	Clock generator; 4V to 7V operating supply range, 1ns skew, CMOS or TTL compatible outputs
U22	Phoenix system and VGA BIOS; 150ns, 8-bit operation
U23, U24, U26, U31	System controller (UMC82C491, 493, 495); integrated system, memory, and cache
U25	Local bus IDE controller (ADI2)
U30	Cirrus Logic video controller (GD5428); local bus VGA with integrated palette DAC, dual-frequency synthesizer, BitBLT for GUI acceleration
U34-42	Video DRAM; one chip soldered at U42; eight expansion sockets at U34-U41
U43	Cache tag socket
U44-51	Cache SRAM sockets
CN1	Power supply; 12-pin connector
CN4	Diskette drive connector; 34-pin header
CN5	Keyboard; 6-pin, mini-DIN
CN6	Mouse; 6-pin, mini-DIN
CN7	Optional game port connector interface
CN8	Serial port labeled COM1; 9-pin, D-shell
CN10	Hard disk drive, TURBO, and power LED connector; 6-pin header
CN11	Serial port labeled COM2; 9-pin, D-shell
CN12	Parallel port; 25-pin, D-shell
CN13	Hard disk drive connector; 40-pin header
CN15	Video connector; 15-pin, D-shell
CN16	Speaker connector; 4-pin header
CN18	Reset; 2-pin header
S1	ISA 120-pin slot connector
BAT1	Rechargeable NiCd battery
GF1	VESA slot connector

Microprocessor Upgrades

The computer's processor can be upgraded by replacing the existing microprocessor with a faster one. You can either purchase an upgrade kit from EPSON or buy the individual components separately.

Microprocessor upgrade components

Part	Manufacturer
486SX/33 processor	Intel [®]
486SX2/50 processor	Intel
486SX2/66 processor	Intel
486DX/33 processor	Intel or Cyrix
486DX/40 processor	Cyrix
486DX/50 processor	Intel or Cyrix
486DX2/50 processor	Intel or Cyrix
486DX2/66 processor	Intel
Pentium OverDrive processor	Intel
Heat sink*	Tennmax Trading Corp. [®]

- * A heat sink is necessary for all DX, DX2, and Pentium OverDrive processors. If you purchase your upgrade kit from EPSON, the appropriate heat sink is included.

Connector Pin Assignments

Parallel port connector pin assignments (CN 12)

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe*	10	ACK *	19	Signal ground
2	Data 0	11	Busy	20	Signal ground
3	Data 1	12	PE	21	Signal ground
4	Data 2	13	Select	22	Signal ground
5	Data 3	14	AFD *	23	Signal ground
6	Data 4	15	Error *	24	Signal ground
7	Data 5	16	Init *	25	Signal ground
8	Data 6	17	Selectin *		
9	Data 7	18	Signal ground		

* Active low logic

Serial port connector pin assignments (CN8 and CN 11)

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system.

Microsoft MS-DOS 3.3 and later

Novell® DR DOS®

Novell NetWare* 2.2, 3.12, and 4.01

Novell NetWare Lite

IBM® OS/2

SCO® UNIX

SCO Open Desktop

Microsoft Windows 3.0 and later

Microsoft Windows WorkGroup

Microsoft Windows NT

- Certified as workstation; tested as file server

Your system has also received Novell's 'Yes, NetWare tested and approved' certification as a workstation. As new environments become available, these also will be tested.

Options Available from EPSON

Many options for enhancing this product are available from EPSON, including the following:

Monitors

- 14" VGA monochrome and color monitors**
- 15" Extended color VGA monitor**
- 17" and 20" Professional Series monitors**

Keyboards

- 101 or 102 USA**
- 102 International language**

Mouse

- 6-pin PS/2-type mouse**

Mass storage devices

- 5.25- and 35-inch diskette drives**
- Hard disk drives from 80 to 540MB**

Upgrade kits

- Call the EPSON Connection for availability of memory, cache, and processor upgrade kits.**

Printers

- 9-pin and 24pin dot matrix printers**
- Laser printers**
- Ink jet printers**

Glossary

BIOS

Basic Input/Output System. Routines in ROM (Read Only Memory) that handle the transfer of information in your operating system.

Cache

A high-speed memory buffer that stores frequently used data where your microprocessor can access it faster. Your computer includes 8KB of internal cache built into the microprocessor, and this can be expanded to 256KB with external cache chips.

CPU

Central Processing Unit. The primary device that interprets instructions, performs tasks, keeps track of stored data, and controls input and output operations. See also Microprocessor.

Device driver

A file containing instructions that allow your computer to recognize and communicate with a device. The device may be a printer, monitor, or other type of device.

DPMS

Display Power Management Signaling. The standards established to define power management states for low power consumption monitors, and to determine how the display controller signals the monitor to enter a low power mode.

IDE

Integrated Drive Electronics. A type of hard disk drive interface in which the controller is on the drive instead of on a controller card. Your computer includes an interface on the main system board for up to two IDE hard disk drives.

ISA

Industry Standard Architecture. The 8- or 16-bit standard developed for IBM® compatible computers.

Jumper

A small movable plug that connects two pins on a device's circuit board. Jumpers alter the operation of a particular function.

Local bus

An internal bus that controls the connections from the microprocessor to the VGA and IDE interfaces. Local bus provides increased performance and speed.

Memory module

A small circuit board, commonly called a SIMM (single inline memory module), that contains surface-mounted memory chips. You can add memory modules to the main system board to expand your computer's memory.

Microprocessor

A small CPU on one semiconductor chip. See also CPU.

Parallel

An interface that transmits data simultaneously over separate wires in a cable. See also Serial.

Pentium OverDrive

A sophisticated CPU which incorporates the latest in Pentium technology, including a 64-bit data path, one 8KB internal cache for read-only code, a second 8KB internal cache for read-write data, and the ability to execute instructions in parallel.

Power-on diagnostics

Tests stored in a computer's ROM that the computer runs to check its internal circuitry, peripheral device configuration, and operating status each time you turn it on or reset it.

RAM

Random Access Memory. The area of the computer's memory used to run programs and store data while you work. All data in RAM is erased when you turn off or reset the computer.

Real Time clock

A battery-powered clock inside the computer that tracks the time and date, even when the computer is turned off.

ROM

Read Only Memory. Memory that can only be read and cannot be modified. ROM retains its contents even when you turn off the computer by using power from a backup battery.

Serial

The type of communication that transmits data from a serial interface to a serial device over a single wire. See also Parallel.

Shadow RAM

The system's ability to copy the contents of the system, video, and external BIOS ROMs into RAM to speed up processing.

SIMM

See **Memory module**.

SVGA

Super VGA (Video Graphics Array). In addition to supporting standard VGA modes, your computer's built-in SVGA controller supports resolutions up to 1280 x 1024 in 16 colors on a compatible monitor. If you upgrade the video memory to 2MB, the SVGA controller supports this resolution in 256 colors.

True Color

A VGA feature that supports 24-bits-per-pixel color, which enables your VGA interface to display 16.8 million colors. The screen image looks more like a photograph than a traditional computer image.

VESA

Video Electronic Standards Association. The standards set for a common hardware and software interface to super VGA video adapters; provides simplified software application access to VGA products.

VGA

Video Graphics Array. A high-resolution display adapter that provides a variety of video modes.

Write-protect

To protect the data on a diskette from being changed by setting the write-protect switch on a 5.25-inch diskette or by placing a write-protect tab over the notch on a 3.5-inch diskette. You cannot change data on a write-protected diskette.

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